Energy Ontario

Transportation Energy Data Report

Volume 1 No. 1

Transportation Energy Management Program

Ministry of Transportation and Communications

Ministry of Energy

Transportation Energy Data Report

Volume 1 No. 1

Transportation Energy Data Report

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J. Randall
Research Analyst

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H.F. Gilbert, Deputy Minister

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G.R. Thompson, Deputy Minister

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Research and Development Branch
Ministry of Transportation and Communications
1201 Wilson Avenue
Downsview, Ontario
M3M 1J8

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FOREWORD

The Transportation Energy Management Program (TEMP) is a joint program involving the Ministry of Transportation and Communications and the Ministry of Energy. Its aim is to initiate and coordinate actions that will reduce Ontario's transportation oil use by increasing the efficiency with which oil products are used, by reducing travel requirements and by introducing alternatives to oil products as transportation fuels.

The impetus for the creation of this report occurred as a direct result of a need expressed by government agencies, research groups, and business, for a central source of transportation energy data. These data have been collected and published in a comprehensive format under one cover for greater convenience.

It is expected that this and subsequent reports will be used to monitor current trends in transportation energy demand, ascertain relationships between various transportation energy variables, and provide a forum for the presentation of transportation energy data in graphical and tabular form.

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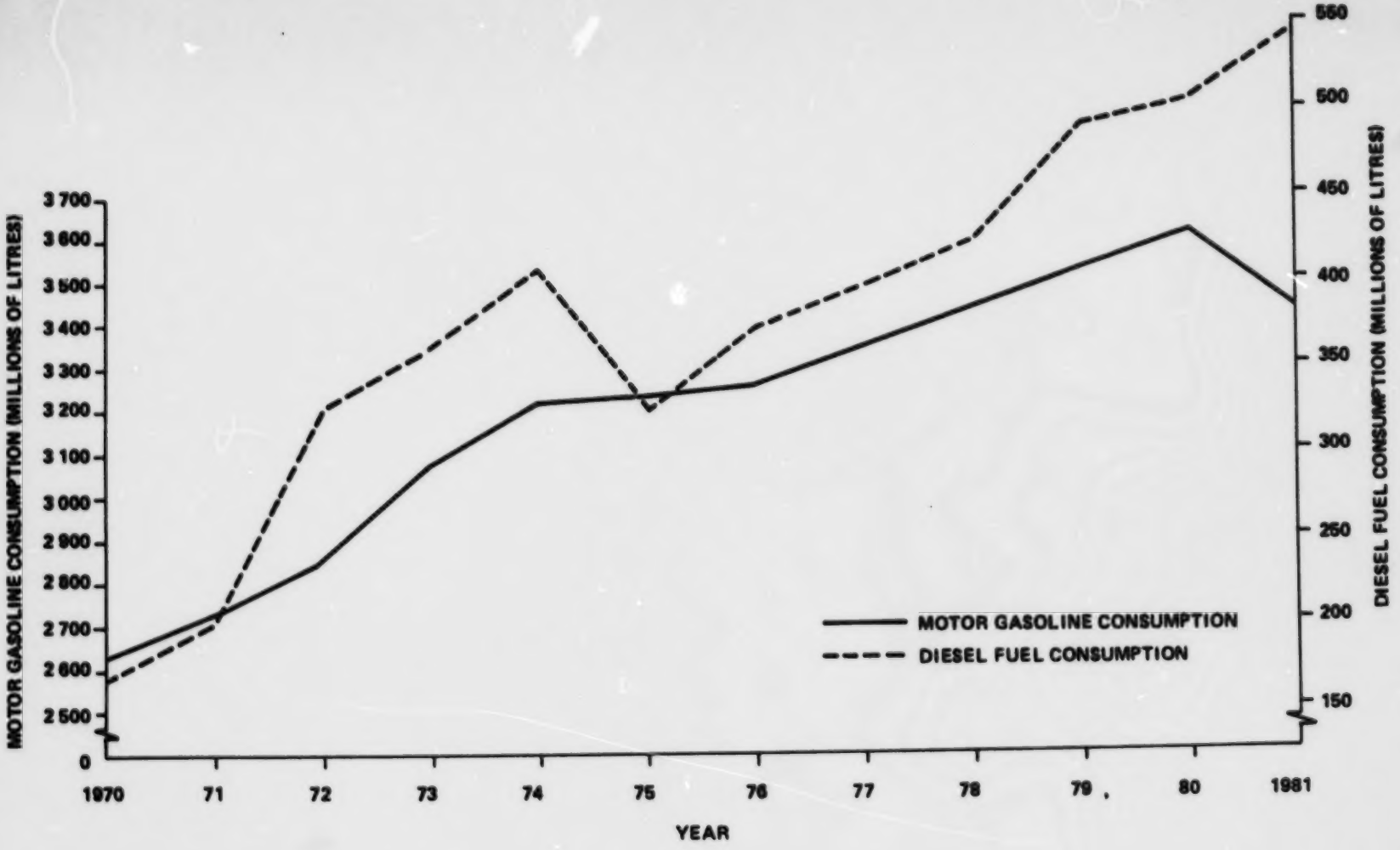
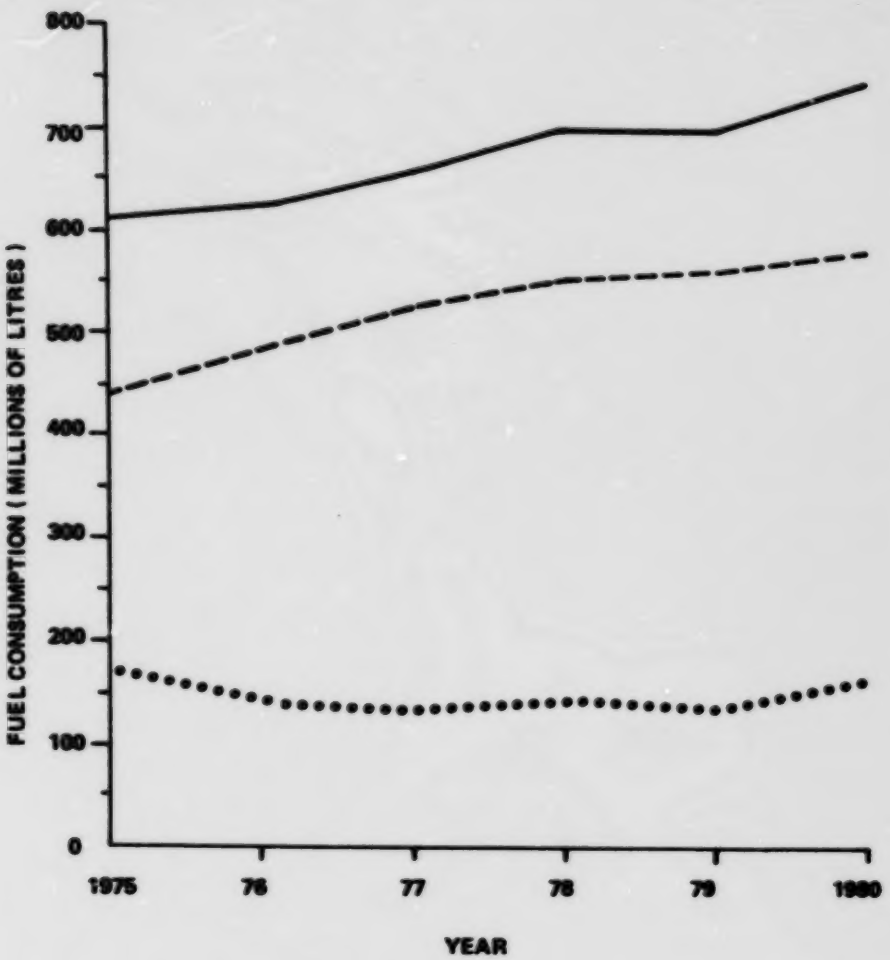


Source: Ontario Ministry of Revenue

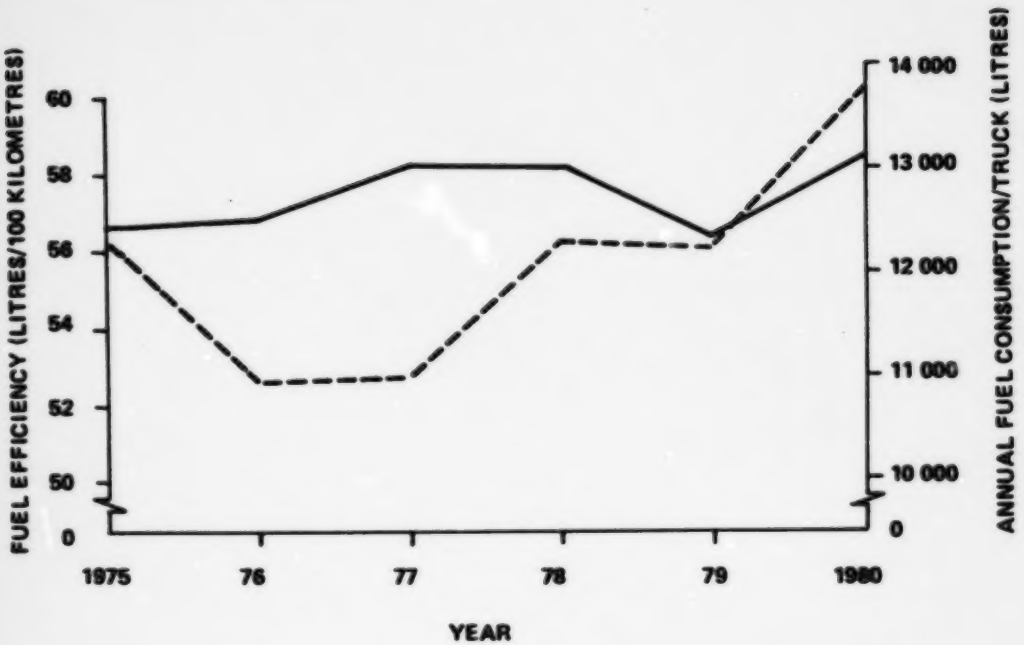
Note: These fuel consumption figures consist of net (after road use tax rebates) final consumer demand by all road motor vehicles in Ontario and may differ from fuel consumption figures in various Statistics Canada publications.

Figure 1/ Net Motor Gasoline and Diesel Fuel Consumption for On-Road Use in Ontario: 3rd Quarter, 1970 to 1981



Source: Statistics Canada 53-222

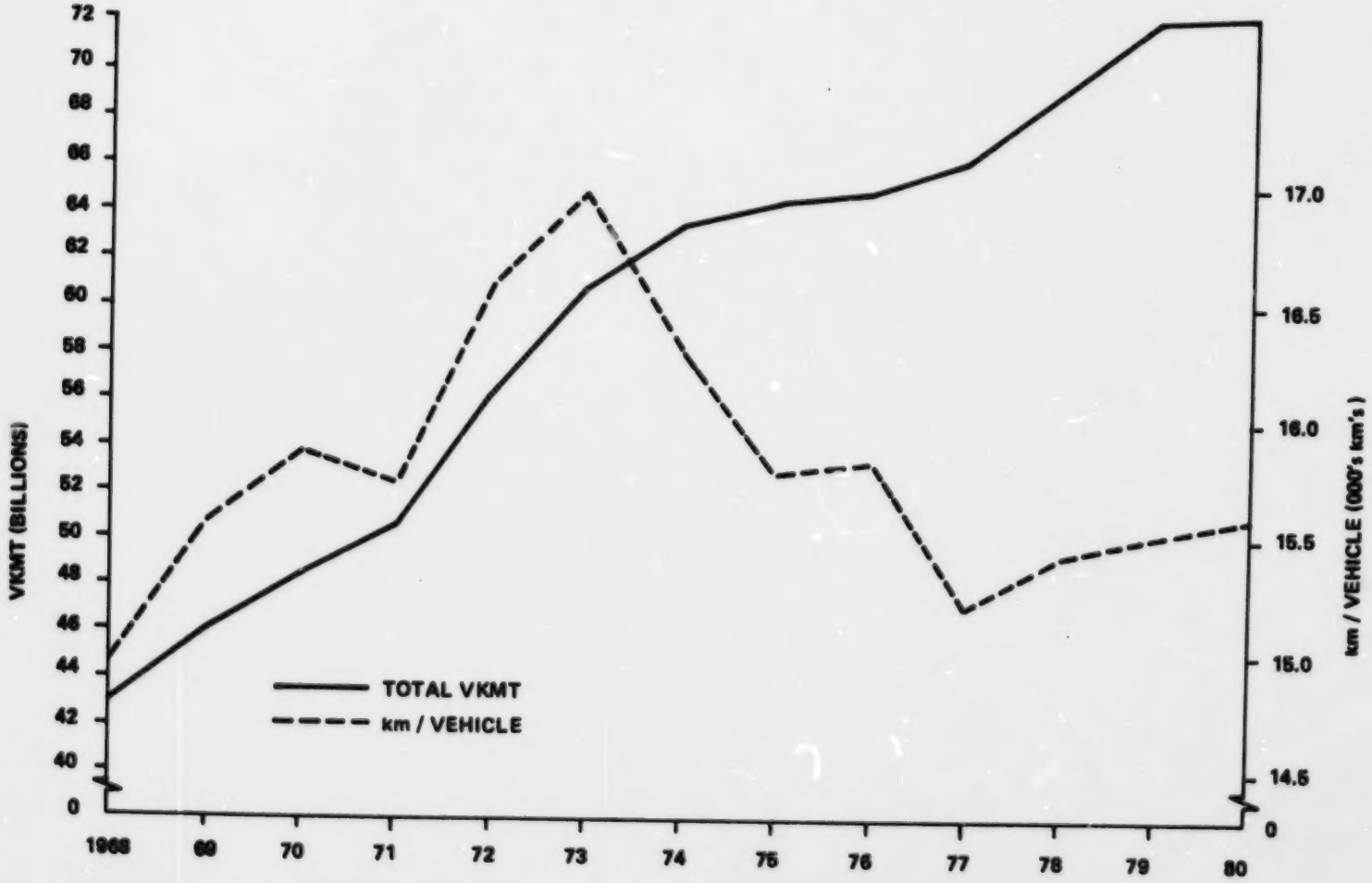
Figure 2/ Fuel Consumption: Ontario's For-Hire Truck Fleet, 1975 to 1980



Source: Statistics Canada 53 - 222

Note: An average fuel efficiency figure per truck was obtained by performing the following calculation. Total Fuel Consumed (Litres) / (Total Fleet Kilometres Travelled X 100)
Trucking fuel consumption and distance travelled are available only for the intercity for-hire truck fleet. This segment of the vehicle population consumed 5% of total road transportation fuel and 19.5% of truck transportation fuel in 1980.

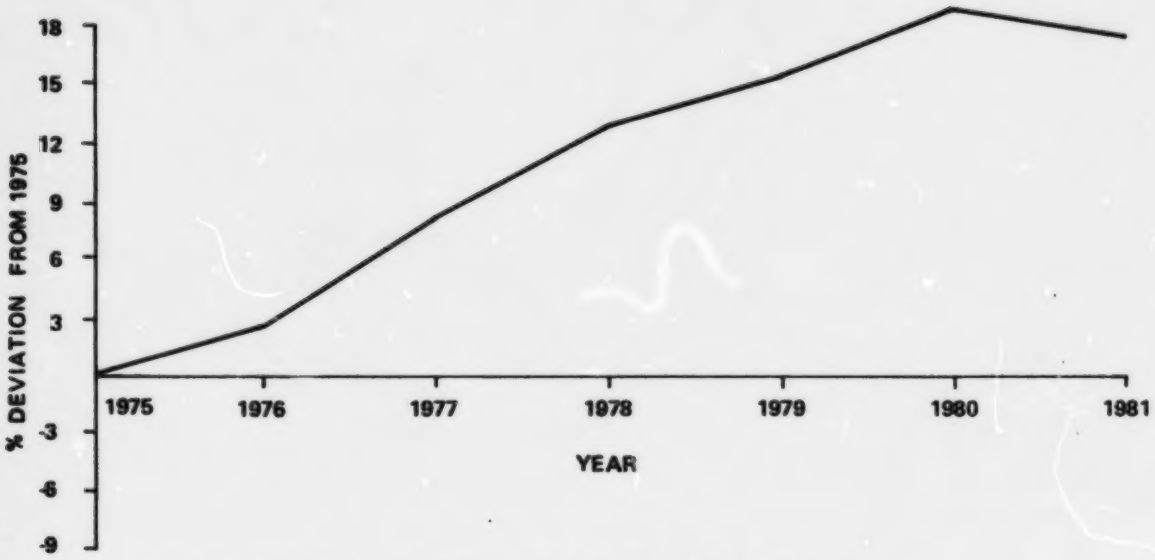
Figure 3/ Average Annual Fuel Consumption and Fuel Efficiency / Truck: Ontario's For - Hire Truck Fleet, 1975 to 1980



Source: Ministry of Transportation and Comunications

Note: Ontario Traffic Volumes are estimated in the Highway Program Development Branch, Ontario Ministry of Transportation and Communications and are published annually in Traffic Volumes on the King's Highways and Secondary Highways. Numbers of registered vehicles are recorded at the Vehicles Control Office, Ontario Ministry of Transportation and Communications.

Figure 4/ Historical Trends, Ontario Traffic Volumes and Average Travel / Vehicle, 1968 to 1980



Source: Ontario Ministry of Transportation and Communications

Note: Taken from the annual permanent counting station traffic volume reports, the following methodology is used to obtain this figure.

1. Sum the average daily travel volume for each of July, August and September.
2. Sum these quarterly volumes over the total comparable number of permanent counting stations in the survey (14).
3. Determine the % deviation (+ or -) of each year from the base of 1975.

Figure 5/ Ontario Permanent Counting Station Traffic Volume Deviations, 3rd Quarter, 1975 to 1981

Table1/ New Automobile Registrations in Ontario, 3rd Quarter, 1978 to 1981

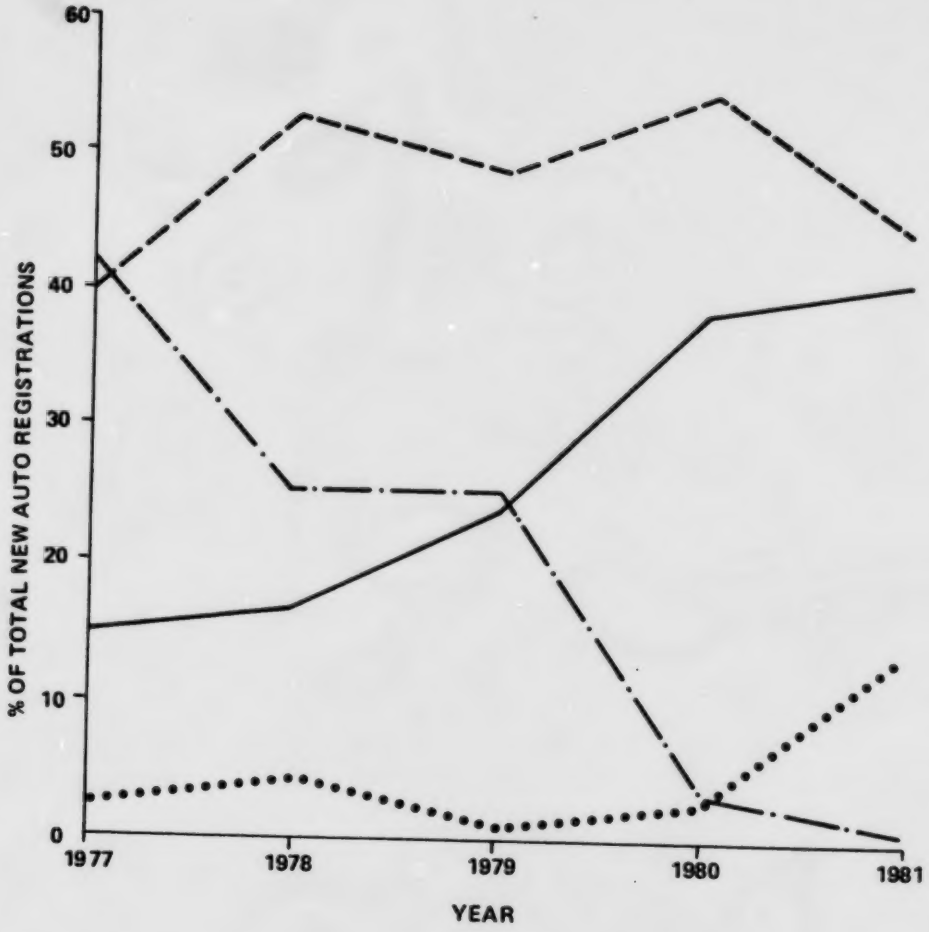
	1978	1979	1980	1981	Average Annual % Change
Passenger Autos (% Dev.)	97276	105979 (+8.95)	90215 (-14.87)	86258 (-4.39)	(-3.43)
Trucks (% Dev.)	26876	30881 (+14.9)	40947 (+32.6)	19609 (-52.11)	(-1.54)

Source: R.L. Polk & Co. Ltd.

Table 2/ Automobile Registrations in Ontario by Number of Cylinders, 1975 to 1980

YEAR	0 - 4 Cylinders	5 - 6 Cylinders	> 6 Cylinders	Total
1980				
No. Autos	813 256	824 714	2 070 575	3 708 545
(%)	21.9	22.2	55.8	99.9
1979				
No. of Autos	747 729	782 858	2 149 421	3 680 008
(%)	20.3	21.3	58.4	100.0
1978				
No. Autos	713 697	750 009	2 118 988	3 582 694
(%)	19.9	20.9	59.2	100.0
1977				
No. Autos	669 395	722 073	2 093 668	3 485 136
(%)	19.2	20.7	60.1	100.0
1976				
No. Autos	632 175	705 536	2 000 062	3 337 773
(%)	18.9	21.2	59.9	100.0
1975				
No. Autos	593 338	714 194	1 913 208	3 220 740
(%)	18.4	22.2	59.4	100.0

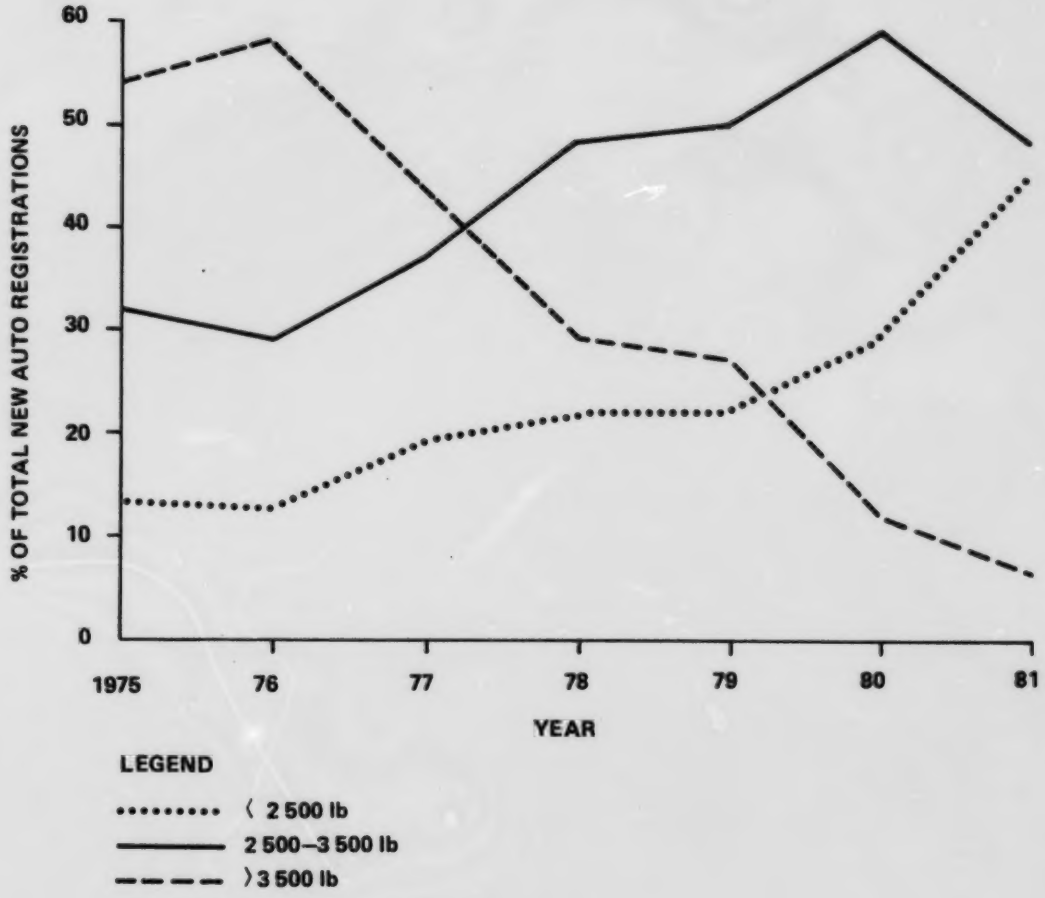
Source: Ontario Ministry of Transportation and Communications



Source: R.L. Polk & Co. Ltd.,
Transport Canada

Note: Annual sales figures supplied by R.L. Polk & Co. Ltd., disaggregated by vehicle make and model type, are reclassified according to the vehicle fuel efficiency ratings provided by Transport Canada in the annual Fuel Consumption Guide.

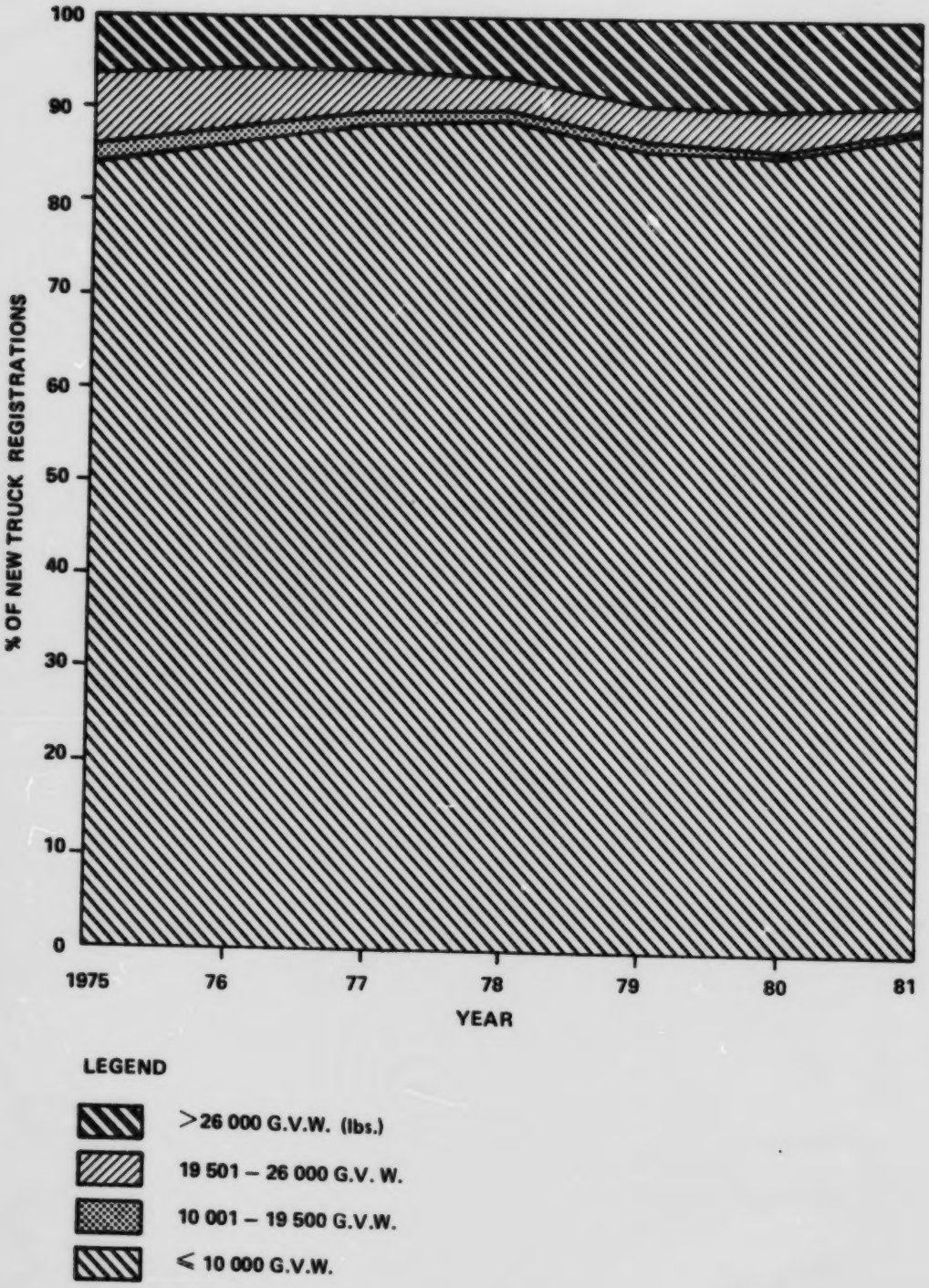
Figure 6/ Fuel Efficiency Distribution of New Auto Registrations in Ontario, 1977 to 1981



Source: R.L. Polk & Co. Ltd., Sanford Evans Motor Vehicle Data Book.

Note: Annual sales figures supplied by R.L. Polk & Co., disaggregated by vehicle make and model type, are reclassified according to the curb weights assigned these vehicles in the annual Sanford Evans Motor Vehicle Data Book.

Figure 7/ Weight Class Distribution of New Auto Registrations in Ontario, 1975 to 1981



Source: R.L. Polk & Co. Ltd.

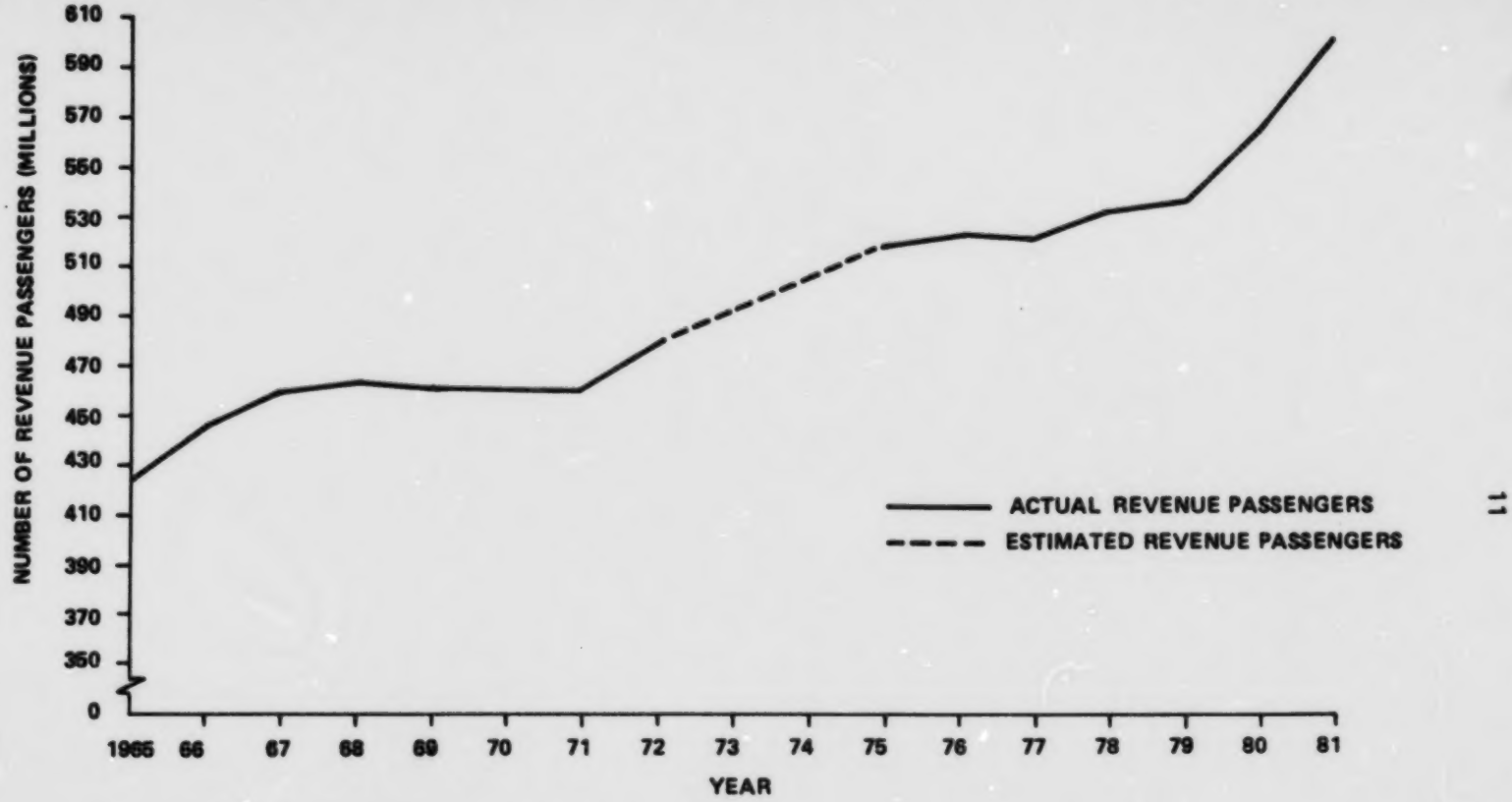
Figure 8/ Weight Class Distribution of New Truck Registrations in Ontario, 1975 to 1981

Table 3/ Urban Transit Passengers in Ontario , 3rd Quarter , 1980 to 1981

	1981	1980	% Change, 80 - 81
Motor Bus	82 947 791	79 876 696	+ 3.8%
Trolley Coach	6 701 580	6 358 260	+ 5.4%
Street Car	14 710 975	14 689 996	+ 0.1%
Other*	35 946 953	33 178 090	+ 8.3%
TOTAL	140 307 299	134 103 042	+ 4.6%

*Other category includes subway, etc.

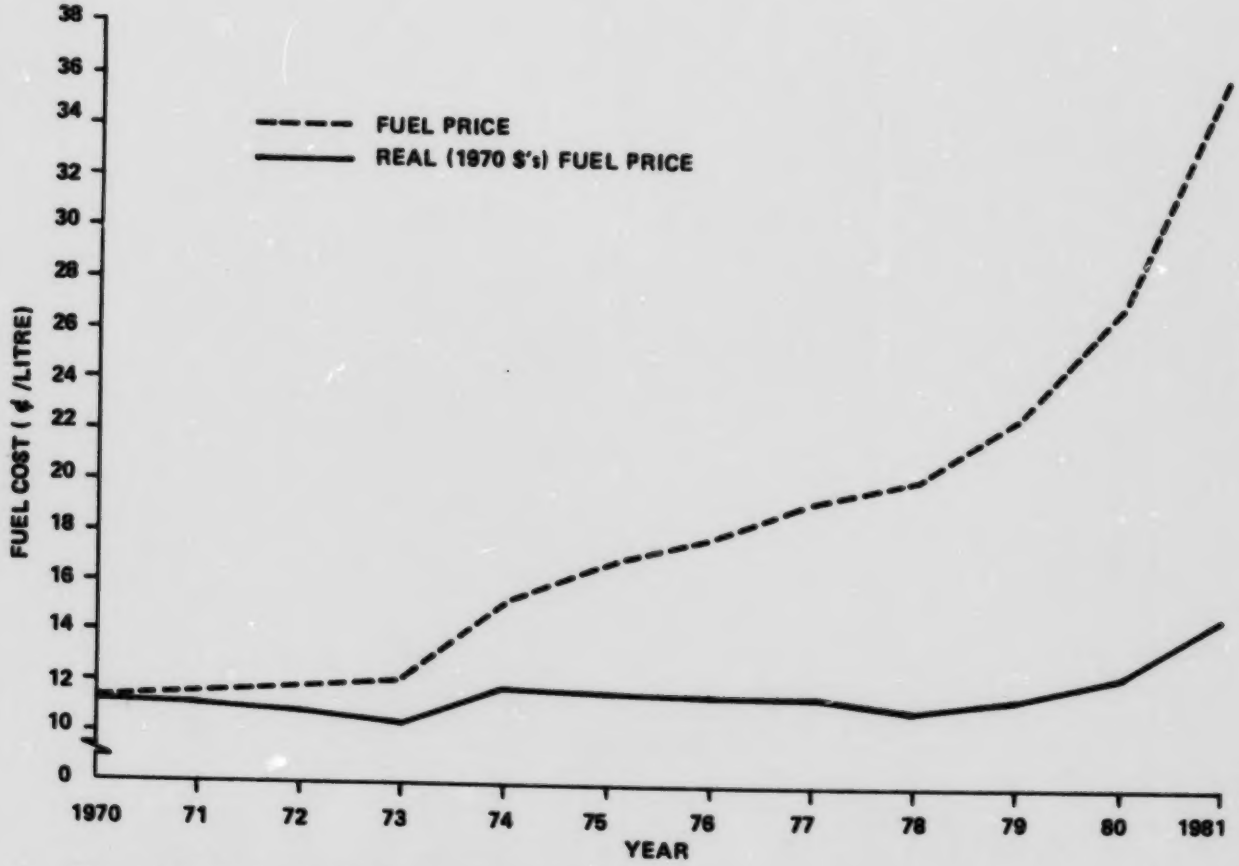
Source: Statistics Canada 53-003



Source: Statistics Canada 53–003

Note: Urban transit ridership figures were not published by Statistics Canada for 1973 and 1974. The estimation for these years is "a best-fit line" between 1972 and 1975.

Figure 9/ Historical Trends, Urban Transit Passengers in Ontario, 1965 to 1981



Source: Statistics Canada 62–001, Ontario Ministry of Energy.

Note: The Consumer Price Index for Canada, obtained from Statistics Canada using 1970 as the base year, was used to deflate the nominal price of fuel.

Figure 10 / Ontario Regular Leaded Fuel Prices, Nominal and Real, 1970 to 1981

COMMENTS

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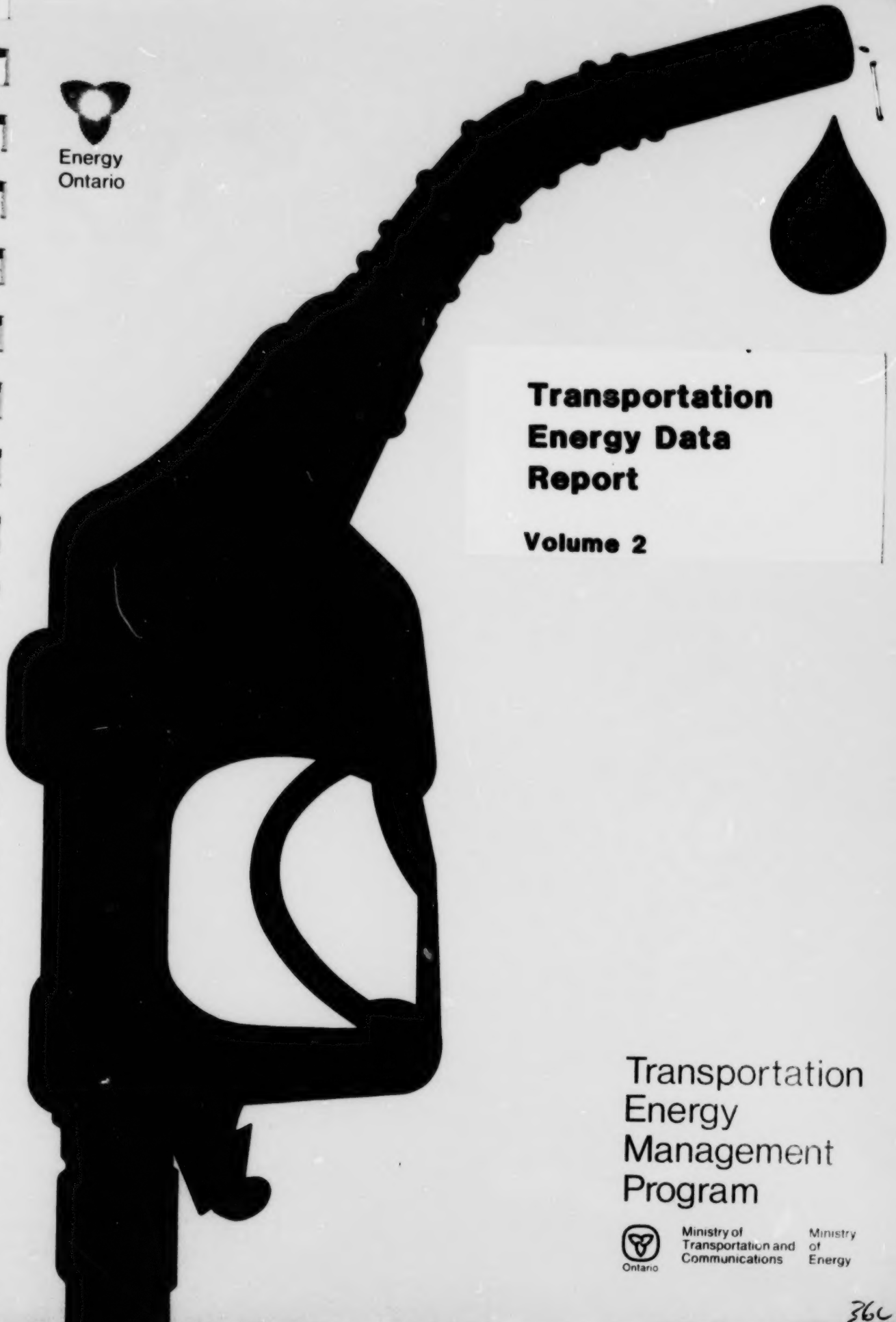

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Volume 2

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May 1983

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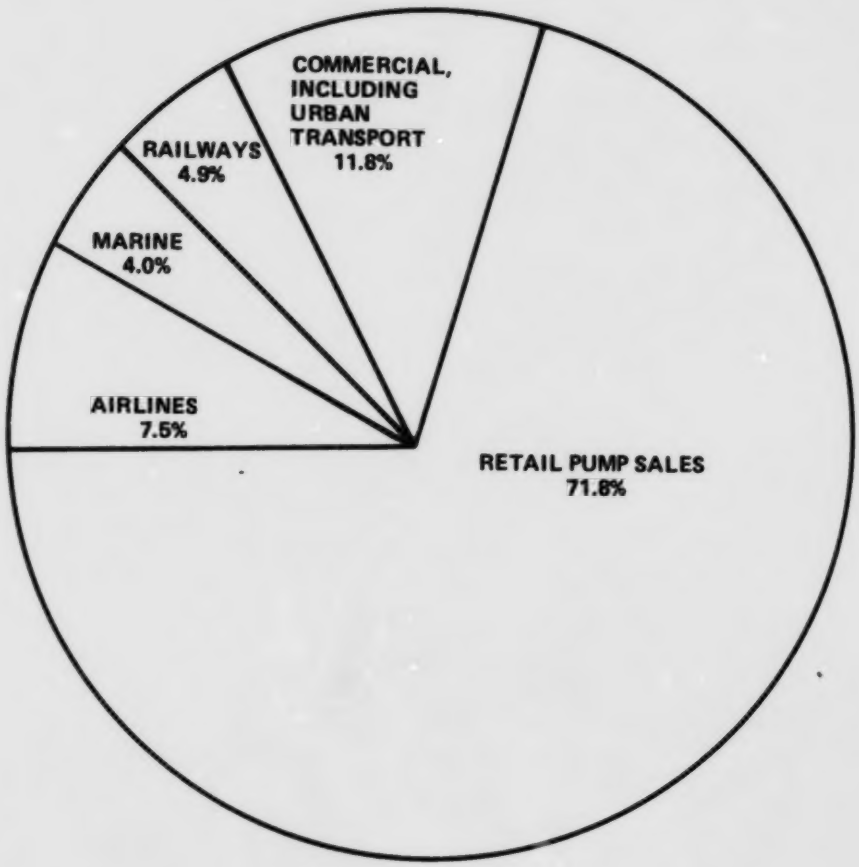
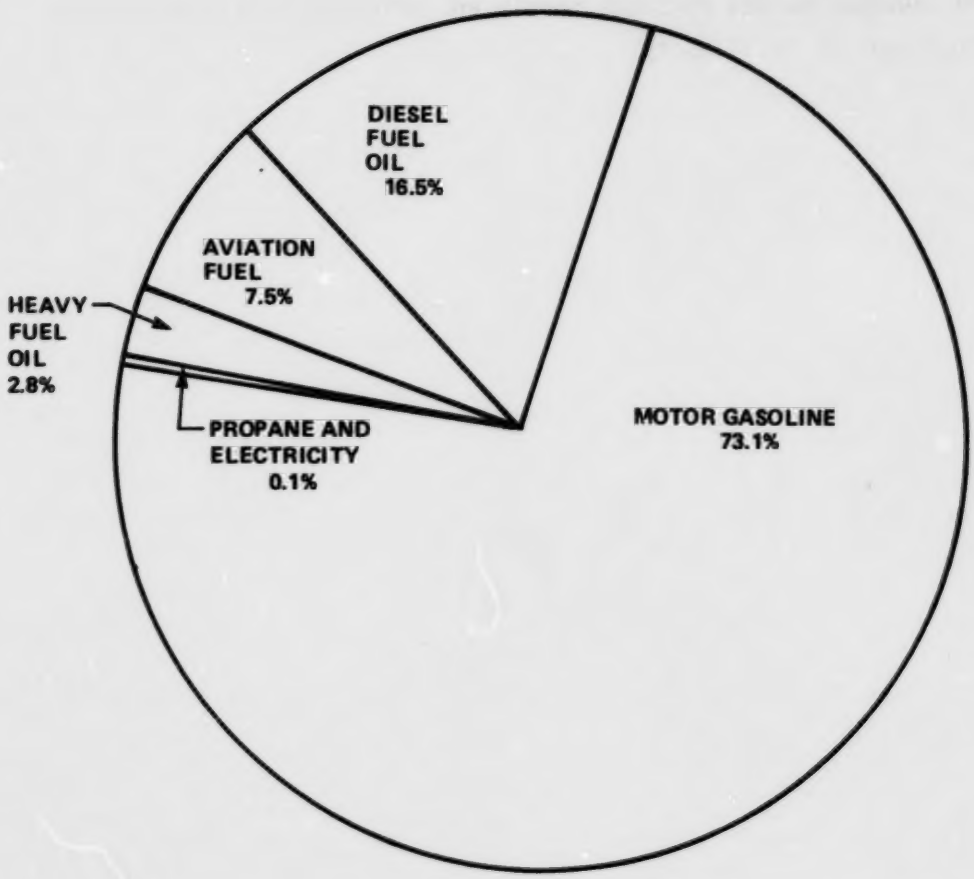
Section One: TRANSPORTATION ENERGY USE AND SUPPLY



SOURCE: STATISTICS CANADA, 57-003

Figure 1.1/ Transportation Energy Use by Mode, Ontario, 1981

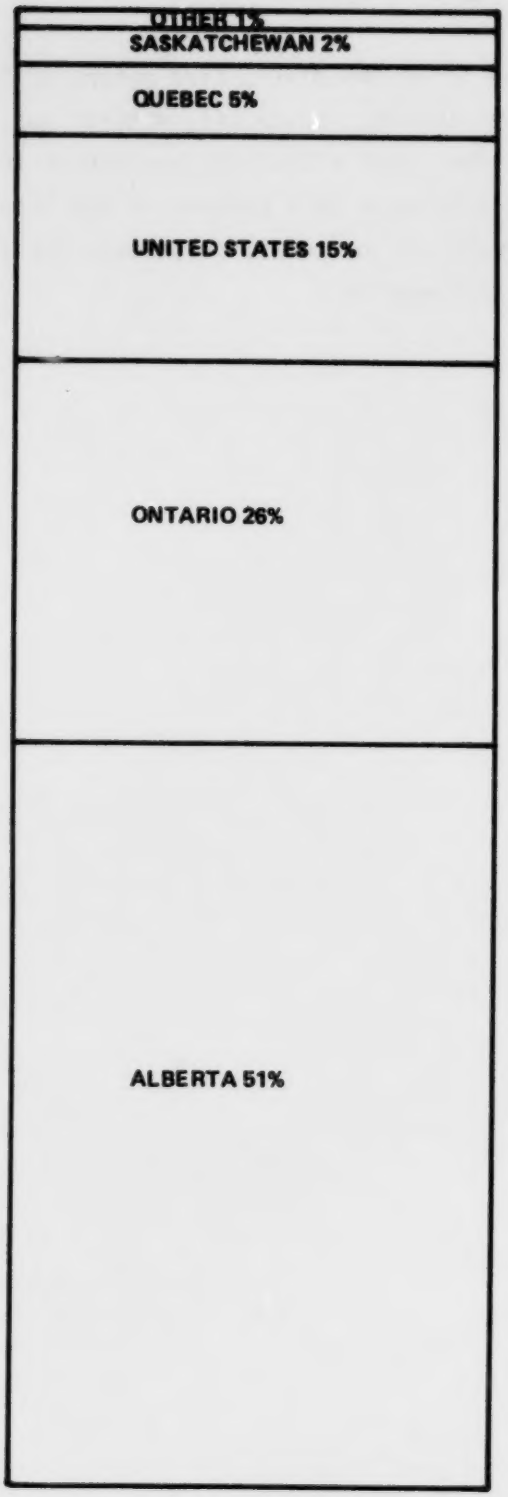


SOURCE: STATISTICS CANADA, 57-003

Figure 1.2/ Transportation Energy Use by Fuel Type, Ontario, 1981

1.3/ Ontario's Primary Energy Sources, 1982 Estimates

Figure 1.3 shows that the largest proportion of Ontario's total energy supplies originate within Canada (84%). Fifty-one percent comes from Alberta in the form of crude oil and natural gas, and 26 percent originates within Ontario, mainly through nuclear-powered, coal- or hydro-generated electricity. Surprisingly, only one percent of the energy consumed in Ontario originates from outside of North America, although, because the entire Canadian market dictates supply and pricing, this independence from foreign sources is illusory.

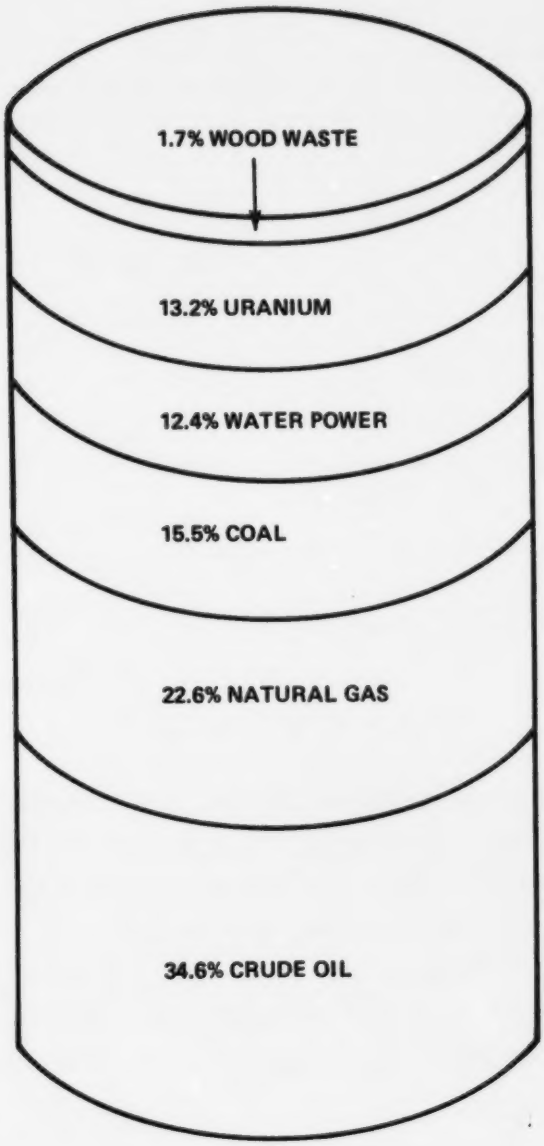


SOURCE: ONTARIO MINISTRY OF ENERGY

Figure 1.3/ Ontario's Primary Energy Sources, 1982 Estimates

1.4/ Ontario's Primary Energy Consumption, 1982 Estimates

The accompanying Figure 1.4 shows the diversified nature of Ontario's primary energy forms. Five sources: crude oil, natural gas, coal, water power and uranium; account for greater than ten percent of the total - energy source each. Crude oil, with 34.6 percent of the total, and natural gas, with 22.6 percent of the total, constitute the first and second largest sources of consumption.



TOTAL CONSUMPTION 3170 PETAJOULES

SOURCE: ONTARIO MINISTRY OF ENERGY

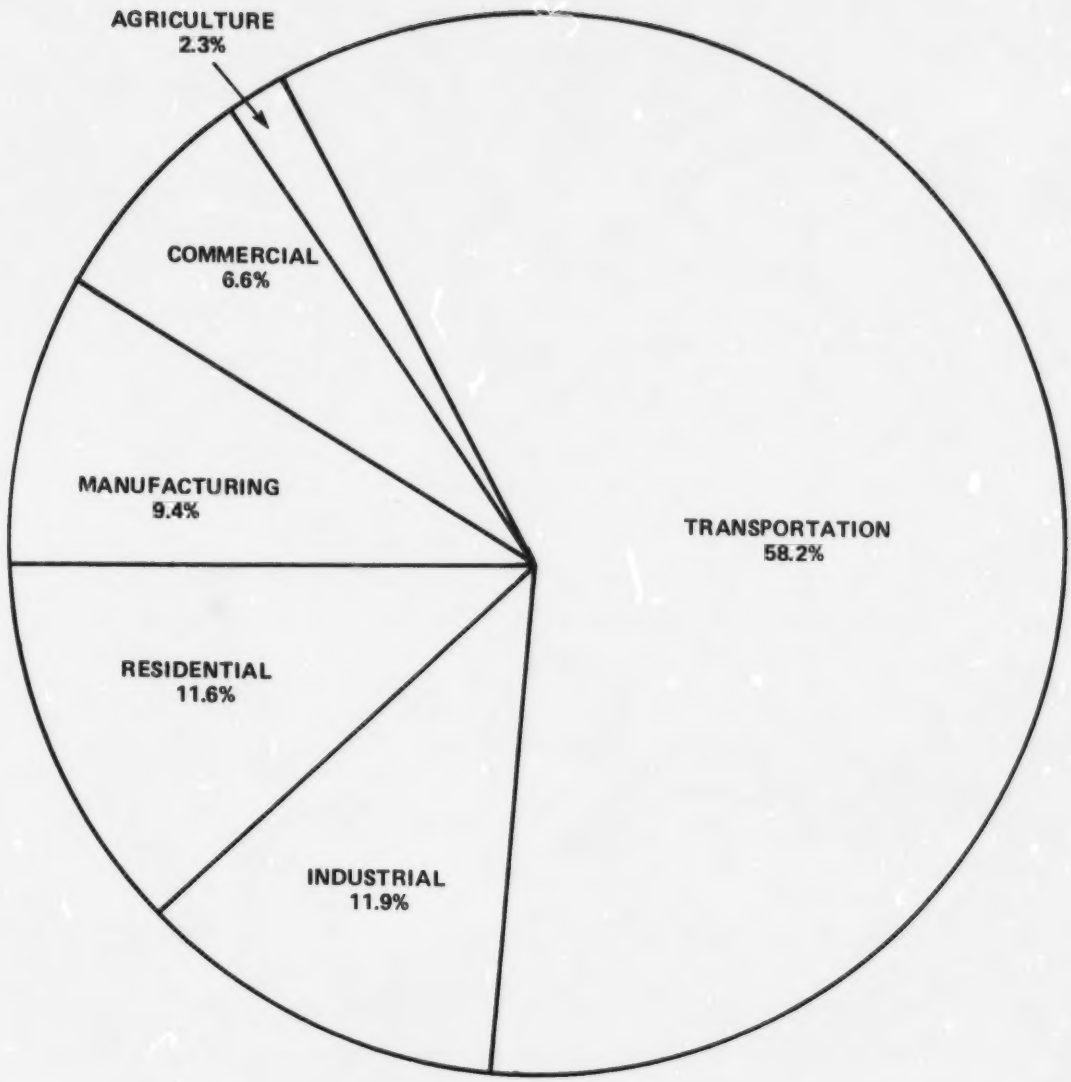
Figure 1.4/ Ontario's Primary Energy Consumption, 1982 Estimates

Table 1.5/ Refined Petroleum Product Use By Major Consuming Sector, Ontario 1981

Sector	Number of Megalitres	Percent
Manufacturing	91 166	9.4
Industrial	114 592	11.1
Transportation	561 900	58.2
Agriculture	22 598	2.3
Residential	112 000	11.6
Commercial	63 766	6.6
TOTAL	966 022	100.0

Source: Statistics Canada, 57-003

The transportation sector consumes, by far, the largest proportion of total petroleum products in Ontario (58.2 percent of the total). The accompanying pie graph (Figure 1.5) depicts the overwhelming importance of petroleum products, conservation, and substitution related to the transportation sector. Any change in petroleum products' supply, demand, or pricing will have a much more profound effect upon transportation than on the remaining sectors of the economy.



SOURCE: STATISTICS CANADA, 57-003

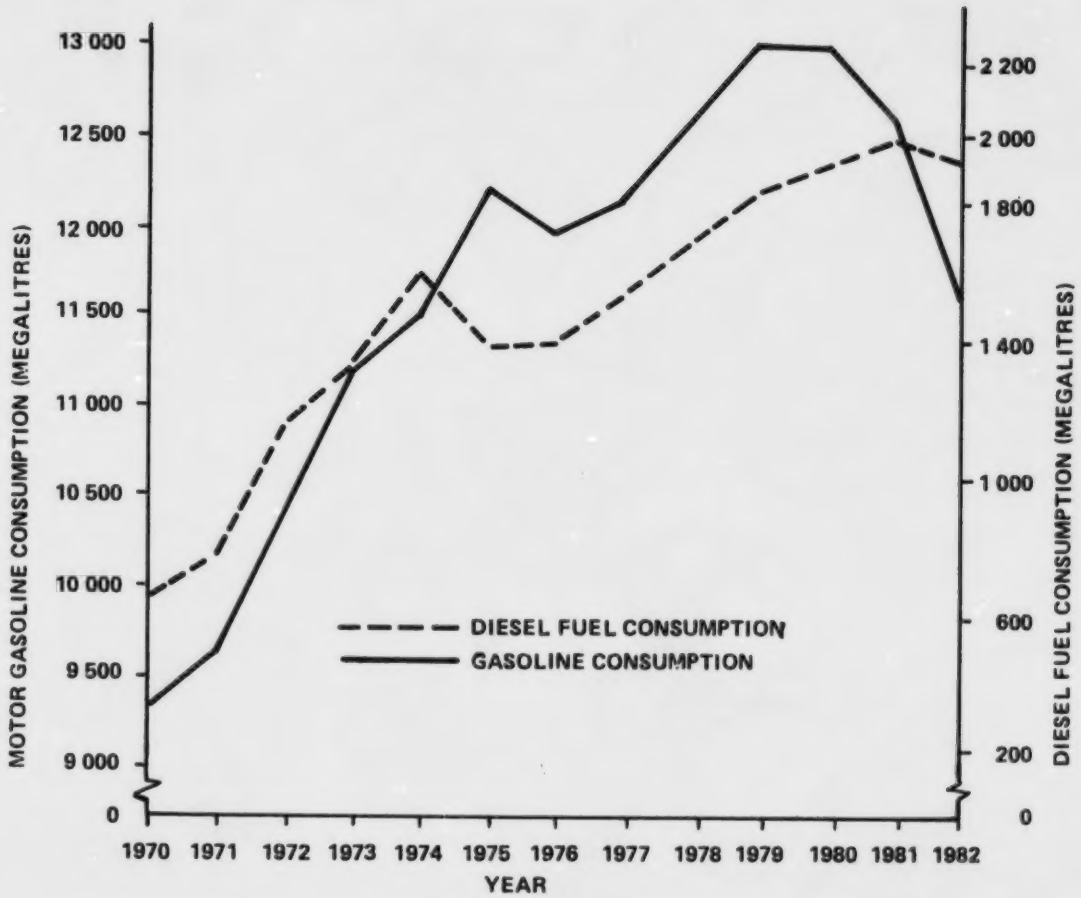
Figure 1.5/ Refined Petroleum Product Use by Major Consuming Sector, Ontario 1981

Table 1.6/ Motor Gasoline And Diesel Fuel Consumption, Ontario, 1970-1982

Year	Gasoline (litres)	Diesel Fuel (litres)
1970	9 320 962 500	633 086 230
1971	9 655 767 200	750 978 290
1972	10 414 045 000	1 138 017 500
1973	11 193 129 000	1 322 145 900
1974	11 505 699 000	1 549 199 500
1975	12 206 783 000	1 369 705 700
1976	11 967 745 000	1 398 525 500
1977	12 137 897 000	1 533 014 800
1978	12 597 348 000	1 673 966 800
1979	13 014 050 176	1 843 238 206
1980	13 004 786 850	1 918 389 584
1981	12 606 944 668	1 989 809 491
1982	11 578 399 668	1 923 966 000*

* Estimated Months From Sept-Dec 1982
Source: Ontario Ministry of Revenue

Given the historical trend of steadily increasing motor gasoline and diesel fuel consumption in Ontario, the change that has occurred since 1980 is all the more amazing. The decline in motor gasoline consumption of 11 percent in this two-year period can be accounted for by both conversion/substitution and the economic recession.



SOURCE: ONTARIO MINISTRY OF REVENUE

NOTE: Figures for diesel fuel consumption from Sept. to Dec. 1982 were not available. An estimate was made for these months based on historical trends.

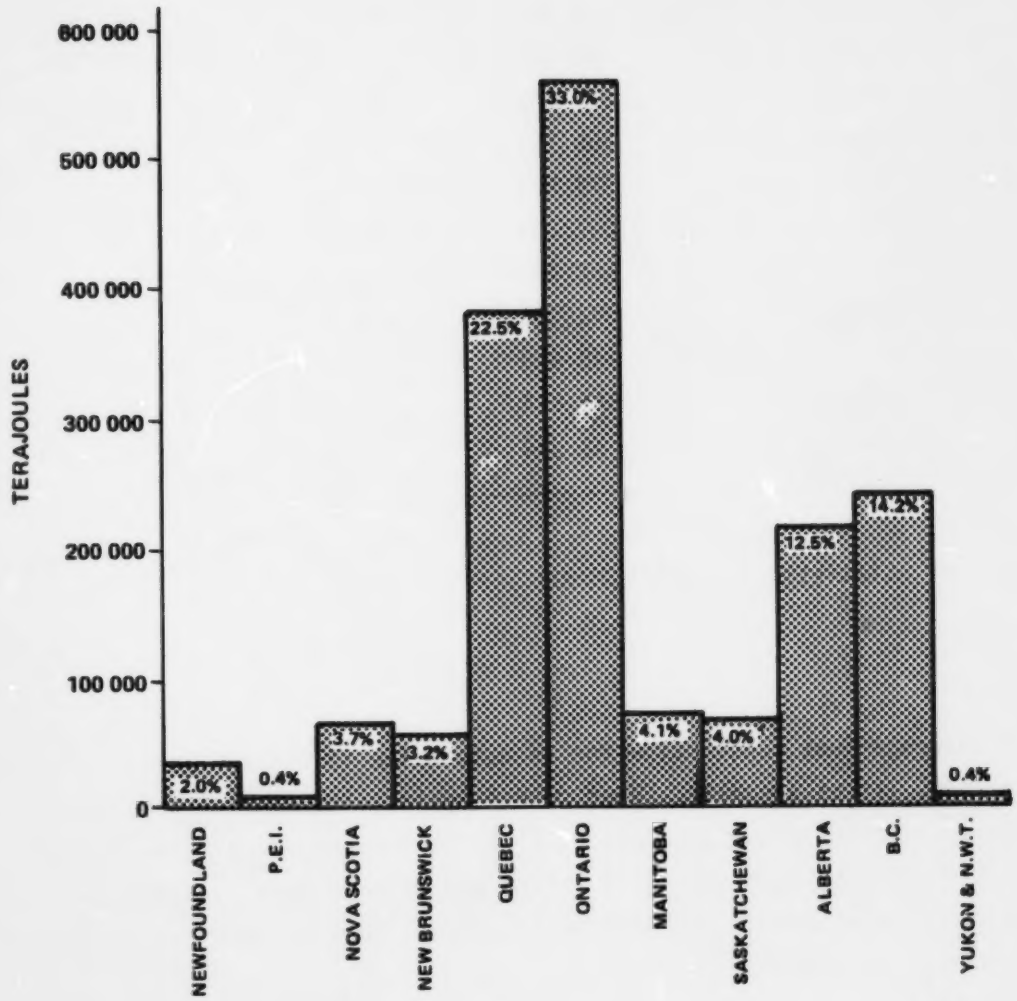
Figure 1.6/ Motor Gasoline and Diesel Fuel Consumption – Ontario 1970 – 1982

Table 1.7/ Transportation Energy Consumption By Province, 1981

Province	Number of Terajoules	Percentage
Newfoundland	34 027	2.0
Prince Edward Island	6 799	0.4
Nova Scotia	63 266	3.7
New Brunswick	54 267	3.2
Quebec	384 241	22.5
Ontario	561 900	33.0
Manitoba	70 042	4.1
Saskatchewan	67 834	4.0
Alberta	213 795	12.5
British Columbia	241 909	14.2
Yukon and N.W.T.	6 778	0.4
TOTAL	1 704 838	100.0

Source: Statistics Canada, 57-003

Figure 1.7 shows that the largest proportion of transportation energy consumption within Canada occurs in the Province of Ontario (33 percent). Although this might be expected, given the larger number of motor vehicles, licenced drivers and kilometres of highway, it reveals Ontario's greater dependence on changes affecting transportation energy consumption, supply, and price.



SOURCE: STATISTICS CANADA, 57-003

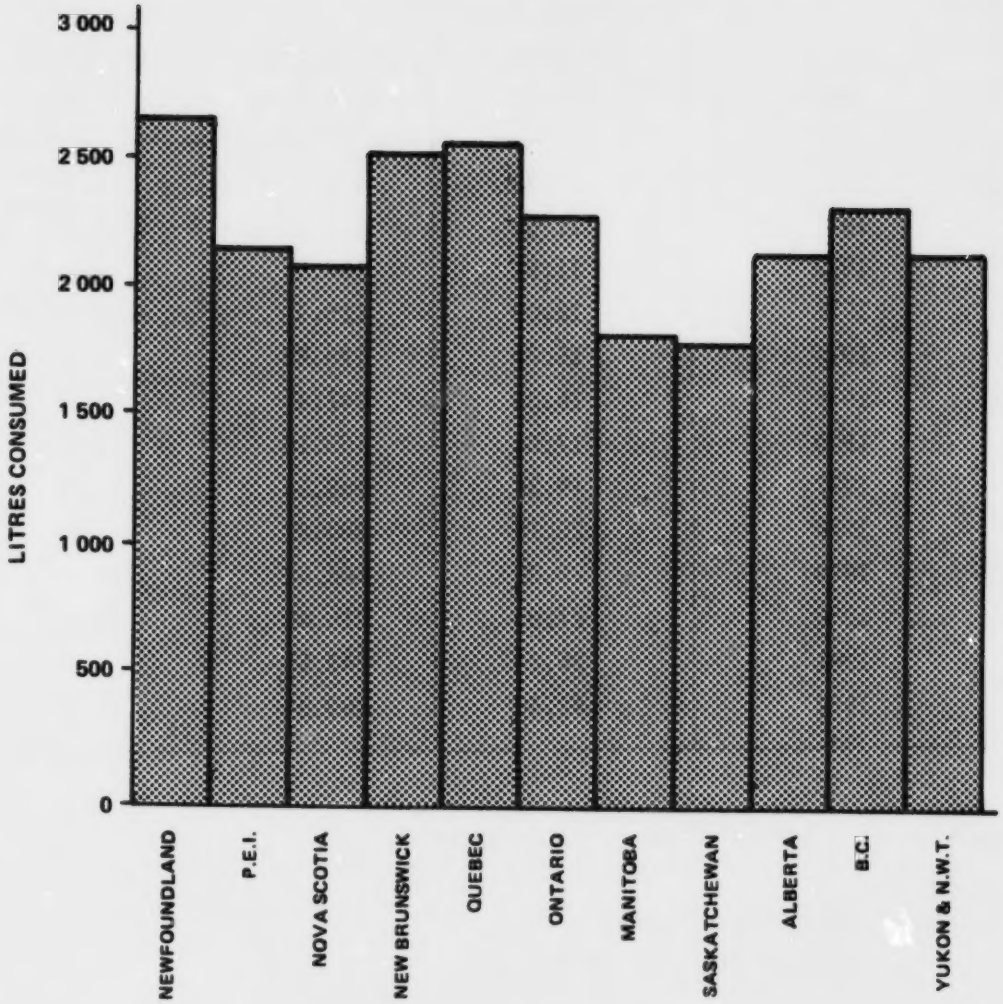
Figure 1.7/ Transportation Energy Consumption by Province — 1981

Table 1.8/ Average Number of Litres of Gasoline Consumed Per Automobile, By Province, 1981

Province	Road Vehicle Registrations	Number Of Megalitres	Number Of Litres/Automobile
Newfoundland	209 482	555.6	2 654
Prince Edward Island	68 396	147.6	2 149
Nova Scotia	515 689	1 077.4	2 089
New Brunswick	365 951	925.0	2 527
Quebec	2 879 827	7 427.4	2 579
Ontario	5 057 801	11 609.6	2 295
Manitoba	662 407	1 216.5	1 836
Saskatchewan	692 023	1 242.9	1 796
Alberta	1 748 918	3 765.1	2 152
British Columbia	1 616 614	3 778.5	2 337
Yukon & N.W.T.	35 374	76.0	2 148

Source: Statistics Canada, 57-003

The average fuel consumption for an automobile in Ontario is approximately 2 300 litres annually. When ranked against the remaining Canadian provinces this consumption places it fifth. There seems to be little relationship between region in Canada and average fuel consumption per automobile, although the "Prairie provinces" seem to have proportionately less fuel consumed per automobile.



SOURCE: STATISTICS CANADA, 57-003

Figure 1.8/ Average Number of Litres of Gasoline Consumed/Automobile by Province, 1981

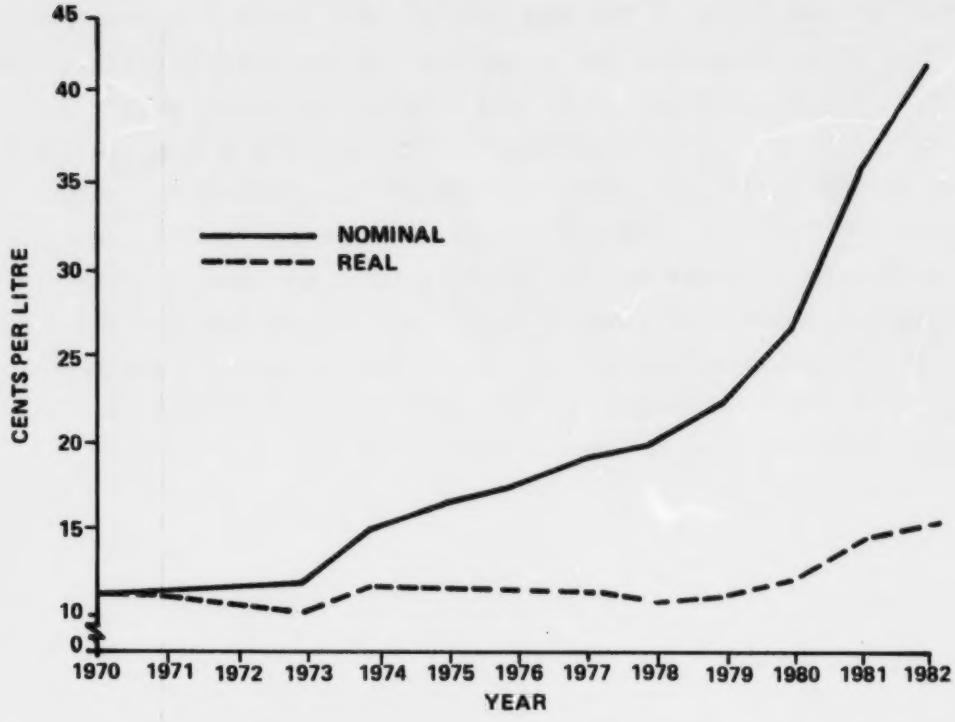
Table 1.9/ Ontario's Regular Leaded Fuel Prices, Nominal and Real, 1970-1982

Year	Nominal Price (In Cents/ Litre)	Price index (1970=100)	Real Price (In Cents/ Litre)
1970	11.28	100	11.28
1971	11.52	102.9	11.20
1972	11.81	107.8	10.96
1973	12.09	115.9	10.43
1974	15.29	128.53	11.90
1975	16.85	142.41	11.83
1976	17.84	153.10	11.65
1977	19.34	165.34	11.70
1978	20.18	180.22	11.20
1979	22.80	196.62	11.60
1980	27.05	216.48	12.50
1981	36.24	243.54	14.88
1982	42.40	269.84	15.71

Real Price = Nominal Price ÷ Price Index x 100

Sources: Statistics Canada, 62-001
Ontario Ministry of Energy

As can be seen from the accompanying Figure 1.10, actual (nominal) motor gasoline prices in Ontario have increased by 400 percent since 1973. However, when this price rise is deflated by the annual consumer price index (ie., inflation rate), the real price change is marginal. This shows that, although the price of gasoline has increased over the past nine years, this increase has been only slightly greater than the price increases for all consumer products combined.

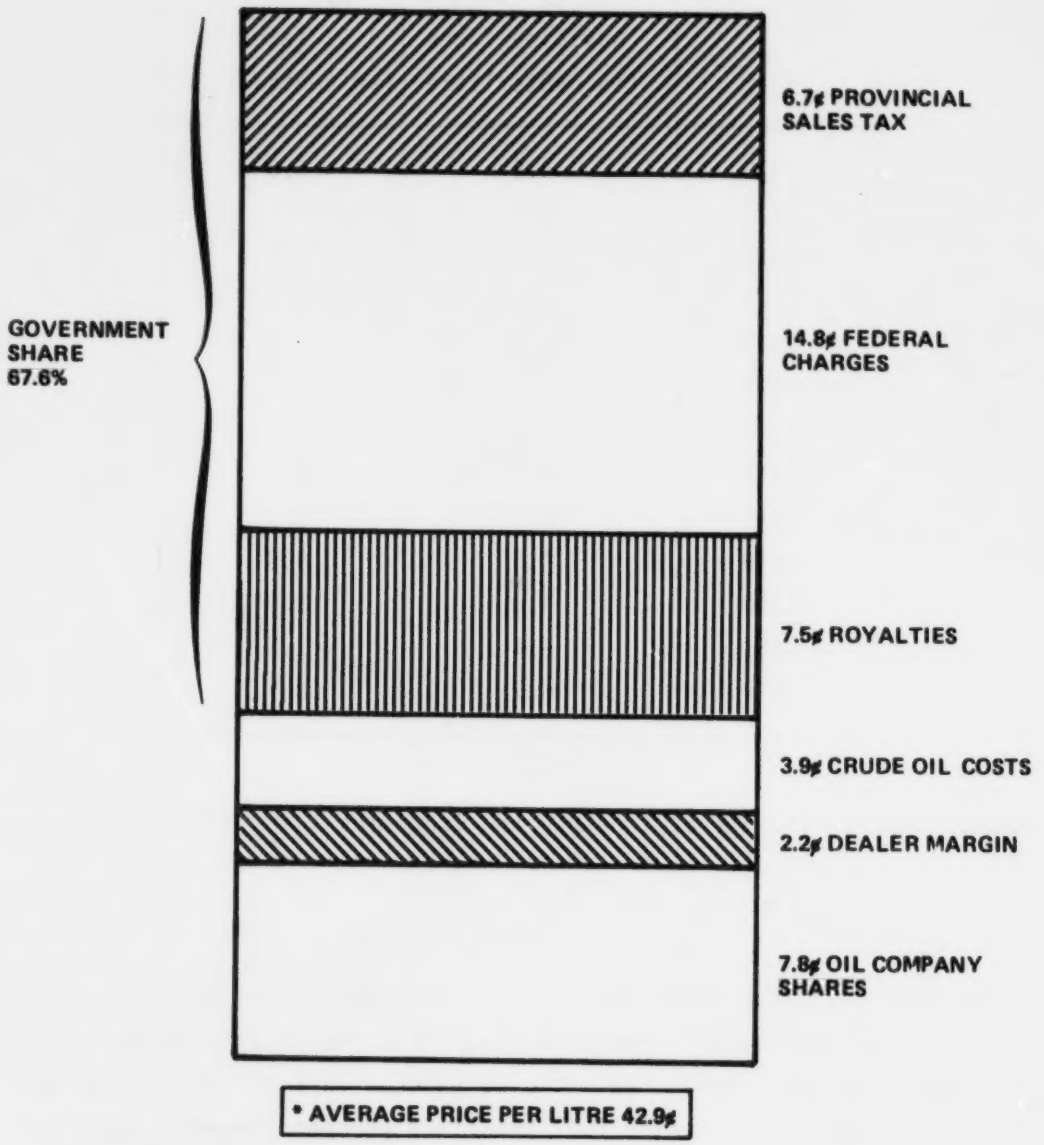


SOURCES: STATISTICS CANADA, 62-001
ONTARIO MINISTRY OF ENERGY

Figure 1.9/ Ontario's Regular Leaded Fuel Prices, Nominal and Real 1970 – 1982

1.10/ Breakdown of Average Leaded Gasoline Price, Ontario, Spring 1982

Based on an average price for regular leaded motor gasoline of 42.9 cents /litre in the spring of 1982, the cost is distributed as indicated on the accompanying Figure 1.10. Federal and provincial taxes and royalties account for two-thirds of the retail price of gasoline. Nine percent of the final price represents the production and transportation costs, and the remaining 23.3 percent is divided between the dealer and the oil company (refiner). It is important to note that this disaggregation is highly dependent upon the categorization of the components. In some sources, the Petroleum Compensation and Canadian Ownership Charges are not represented as taxes because these revenues are used to balance imported oil prices with Canadian prices and to increase the Canadian ownership in the petroleum sector, respectively. As well, the refiner's margin will vary by company and year, depending on the individual taxation deferment plan of the oil company.



SOURCE: PETROLEUM RESOURCES COMMUNICATION FOUNDATION

NOTE: Federal charges include: sales tax, excise tax, petroleum compensation charge and Canadian ownership charge. Royalties are paid to producing provinces, reserves or land with historical significance and foreign countries.

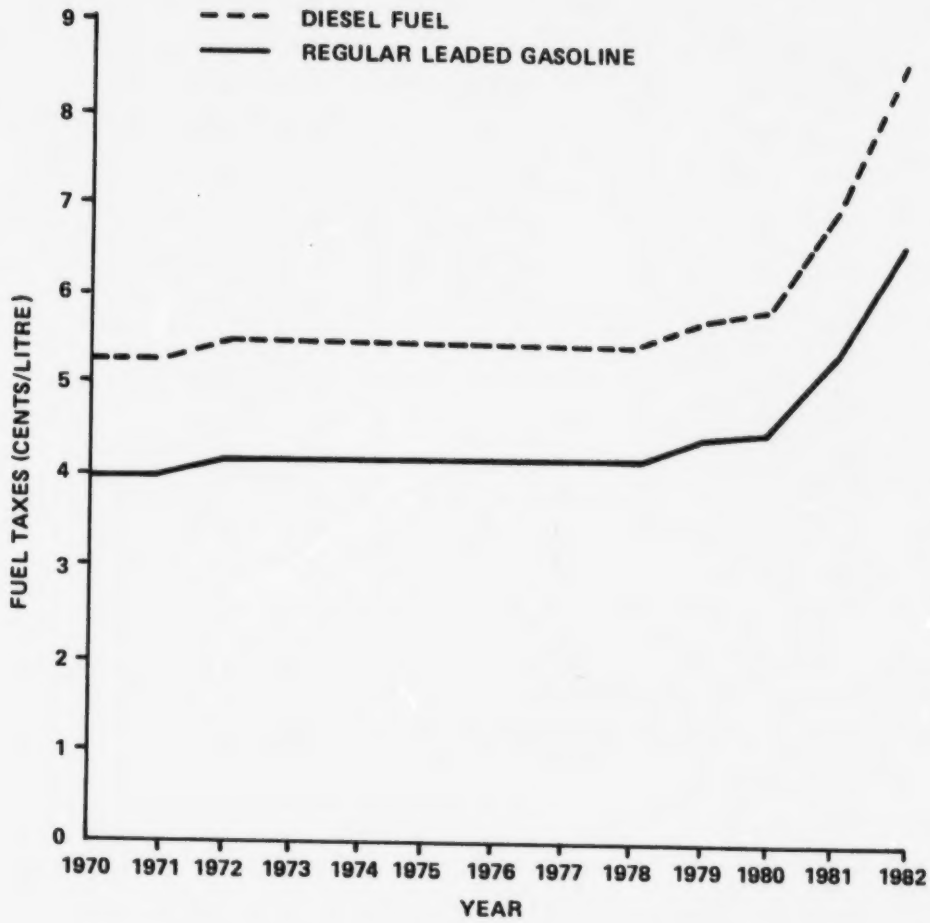
Figure 1.10/ Breakdown of Average Leaded Gasoline Price Ontario, Spring 1982

Table 1.11/ Ontario Government Fuel Taxes, Regular Leaded Gasoline and Diesel Fuel, 1970-1982

Year	Regular Leaded Gasoline Taxes (in cents/litre)	Diesel Fuel Taxes (in cents/litre)
1970	4.0	5.3
1971	4.0	5.3
1972	4.2	5.5
1973	4.2	5.5
1974	4.2	5.5
1975	4.2	5.5
1976	4.2	5.5
1977	4.2	5.5
1978	4.2	5.5
1979	4.5	5.8
1980	4.6	5.9
1981	5.4	7.1
1982	6.7	8.7

Source: Ontario Ministry of Treasury and Economics

The accompanying graph shows that in the mid-1970's, when motor gasoline and diesel fuel prices were increasing rapidly, the Ontario Government fuel taxes remained stable. When the ad valorum fuel tax rate (fuel tax charged is proportional to the fuel price; 20 percent for motor gasoline and 27 percent for diesel fuel) was introduced in 1980, fuel taxes increased at the same rate as retail fuel prices. Although not included on this graph, fuel taxes have dropped in early 1983 in response to lower retail fuel prices.



SOURCE: ONTARIO MINISTRY OF TREASURY AND ECONOMICS

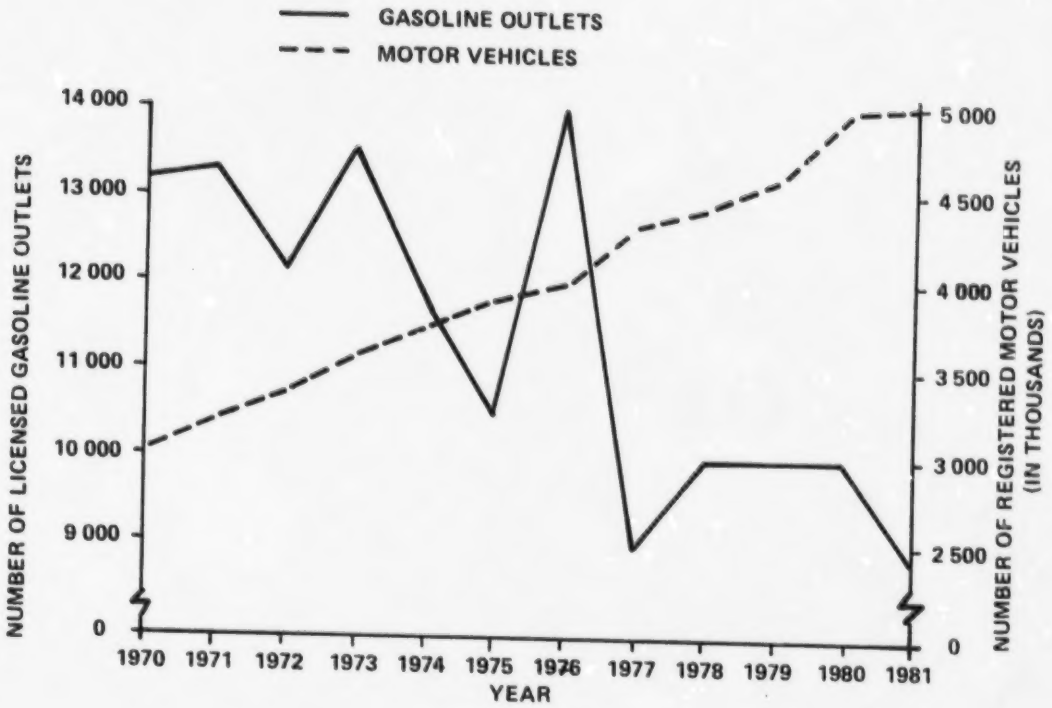
Figure 1.11/ Ontario Government Fuel Taxes, Regular Leaded Gasoline and Diesel Fuel Ontario, 1970 – 1982

Table 1.12/ Number of Registered Motor Vehicles Vs. Number of Gasoline Outlets, Ontario, 1970-1981

Year	Gasoline Outlets	Motor Vehicles
1970	13 206	3 047 599
1971	13 351	3 328 463
1972	12 190	3 386 444
1973	13 566	3 583 369
1974	11 838	3 742 821
1975	10 500	3 911 681
1976	14 000	4 089 954
1977	9 000	4 340 465
1978	10 000	4 474 578
1979	10 000	4 638 887
1980	10 000	5 022 137
1981	8 816	5 050 592

Sources: Statistics Canada, 53-219
Ontario Ministry of Transportation and Communications

Since 1970 there has been a consolidation in the number of motor gasoline refuelling stations, from 13 200 to 8 900 (a decline of 33%). Combined with a 64 percent increase in the number of registered motor vehicles in this eleven year period, this may have resulted in a greater distance between stations and therefore greater fuel consumption for the individual to reach a station.



SOURCES: STATISTICS CANADA, 53-219
ONTARIO MINISTRY OF TRANSPORTATION AND COMMUNICATIONS

Figure 1.12/ Number of Registered Motor Vehicles vs Number of Gasoline Outlets Ontario, 1970 – 1981

Section Two: HIGHWAY MODES

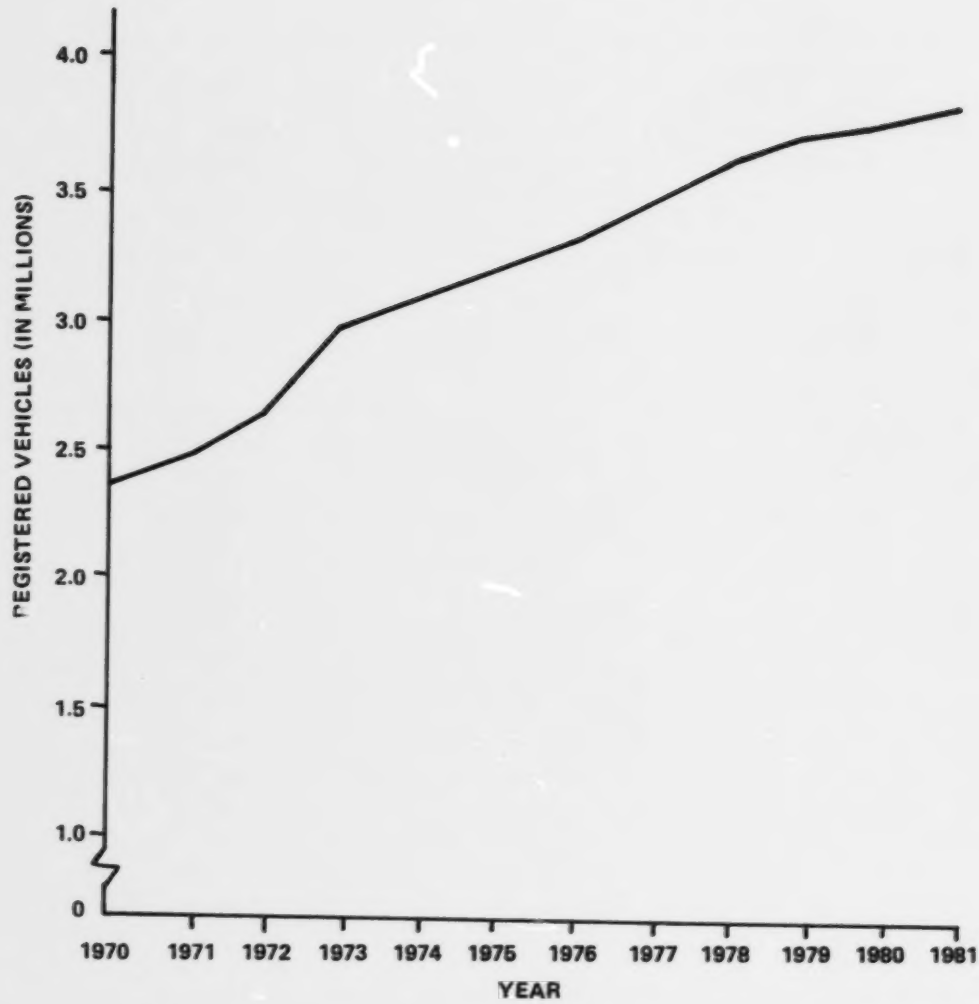
2.1/ Automobiles

Table 2.1.0/ Number of Registered Passenger Vehicles, Ontario, 1970-1981

Year	Number of Vehicles
1970	2 376 435
1971	2 497 307
1972	2 661 998
1973	3 002 091
1974	3 111 367
1975	3 224 621
1976	3 341 845
1977	3 490 477
1978	3 629 553
1979	3 725 187
1980	3 793 835
1981	3 867 071

Source: Ontario Ministry of Transportation and Communications

The number of passenger automobiles registered in Ontario has increased consistently from 1970 to present (2.4 million in 1970 to 3.9 million in 1981). This represents a 63 percent increase in the number of automobiles. Given this large increase in the automobile stock, it is not surprising that motor gasoline consumption has increased by 74 percent over this same period.



SOURCE: ONTARIO MINISTRY OF TRANSPORTATION AND COMMUNICATIONS

NOTE: Includes any automobile or light truck that is not registered as a commercial vehicle.

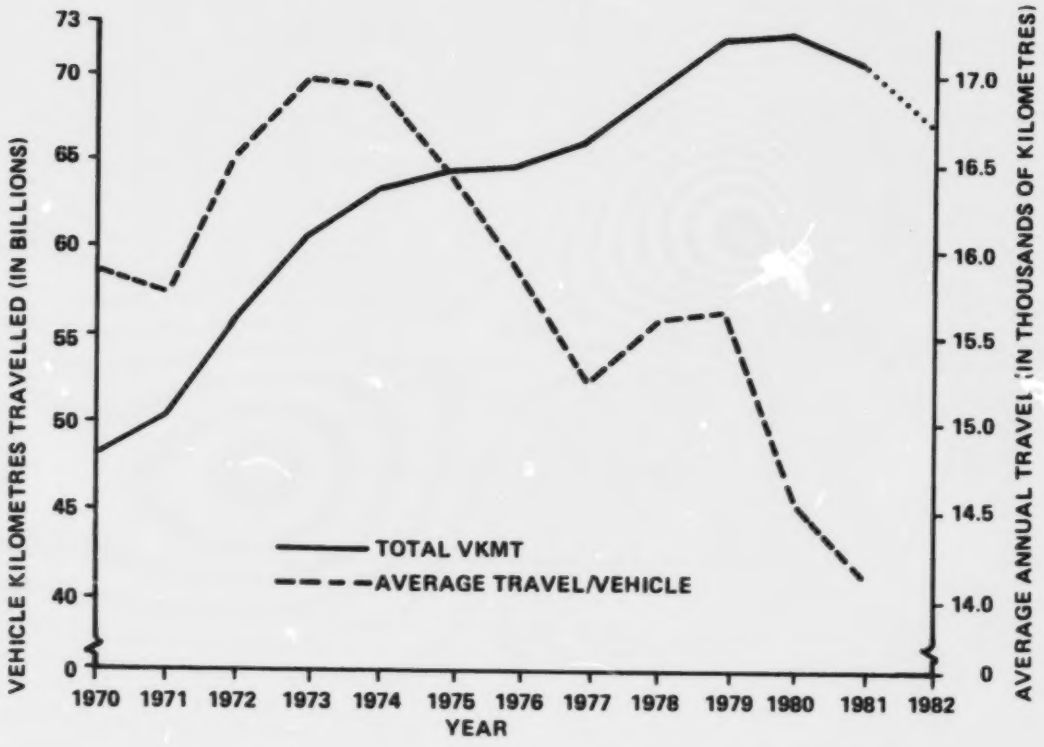
Figure 2.1.0/ Number of Registered Passenger Vehicles – Ontario, 1970 – 1981

Table 2.1.1/ Total Vehicle Kilometres Travelled Vs. Average Annual Travel Per Vehicle, Ontario, 1970-1982

Year	Total Vehicle Kilometres Travelled (in millions)	Total Number Of Vehicles	Average Annual Travel Per Vehicle (in Kilometres)
1970	48 367.1	3 047 599	15 871
1971	50 566.7	3 209 862	15 754
1972	56 132.1	3 386 544	16 575
1973	60 812.2	3 583 379	16 971
1974	63 434.1	3 742 821	16 948
1975	64 422.6	3 911 681	16 469
1976	64 947.5	4 089 954	15 880
1977	66 190.3	4 340 495	15 249
1978	69 317.0	4 442 398	15 604
1979	72 161.4	4 605 671	15 668
1980	72 491.4	4 980 164	14 556
1981	70 906.0	5 014 535	14 140
1982	67 360.7*		

* 1982 is estimated at 5.0% lower than 1981.
Source: Ontario Ministry of Transportation and Communications

The years 1981 and 1982 marked the first time since 1970 that total vehicle-kilometres travelled within the Province of Ontario declined. Although this change has only occurred in the last two years, this decline could have been forecast to occur as early as 1975 when the average travel/vehicle began to decline. From 1974 to 1981 the average travel/vehicle decreased by 16.7 percent.



SOURCE: ONTARIO MINISTRY OF TRANSPORTATION AND COMMUNICATIONS

NOTE: Although at the time of publication 1982 VKMT figures were not available, an estimated five per cent decline took place from 1981.

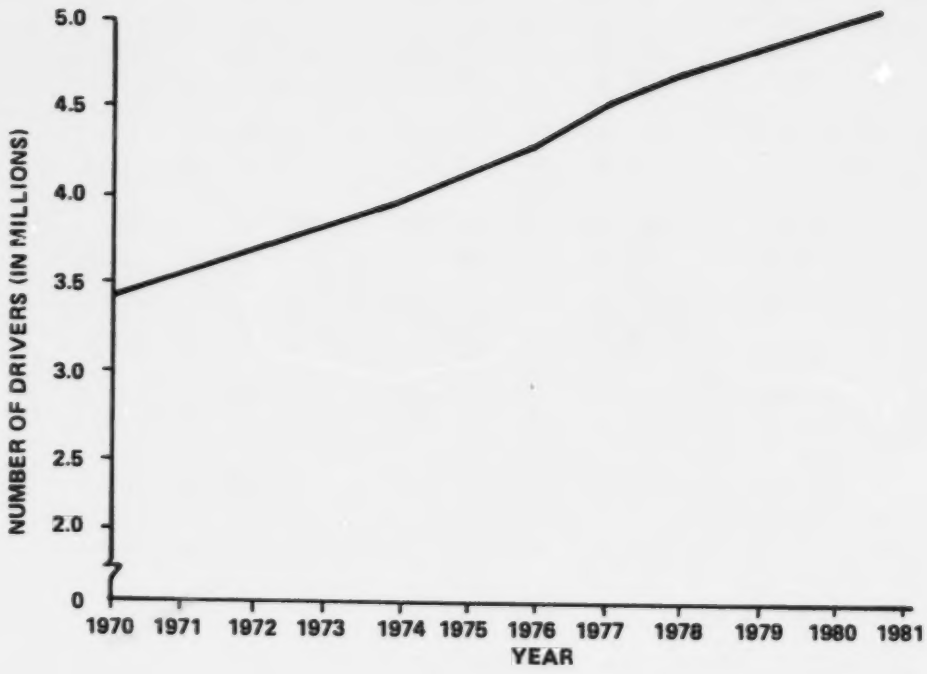
Figure 2.1.1/ Total Vehicle Kilometres Travelled vs Average Annual Travel per Vehicle Ontario 1970 – 1982

Table 2.1.2/ Total Number of Licenced Drivers, Ontario, 1970-1981

Year	Number of Licenced Drivers
1970	3 442 892
1971	3 563 197
1972	3 688 541
1973	3 841 628
1974	3 972 980
1975	4 160 623
1976	4 315 925
1977	4 562 903
1978	4 725 546
1979	4 858 551
1980	4 993 531
1981	5 123 177

Source: Statistics Canada, 53-219

Figure 2.1.2 shows that the total number of licenced drivers in Ontario has increased steadily from 1970 to 1981, from 3.4 million to 5.1 million. This represents an increase of almost 50 percent in the total number of eligible drivers.



SOURCE: STATISTICS CANADA, 53-219

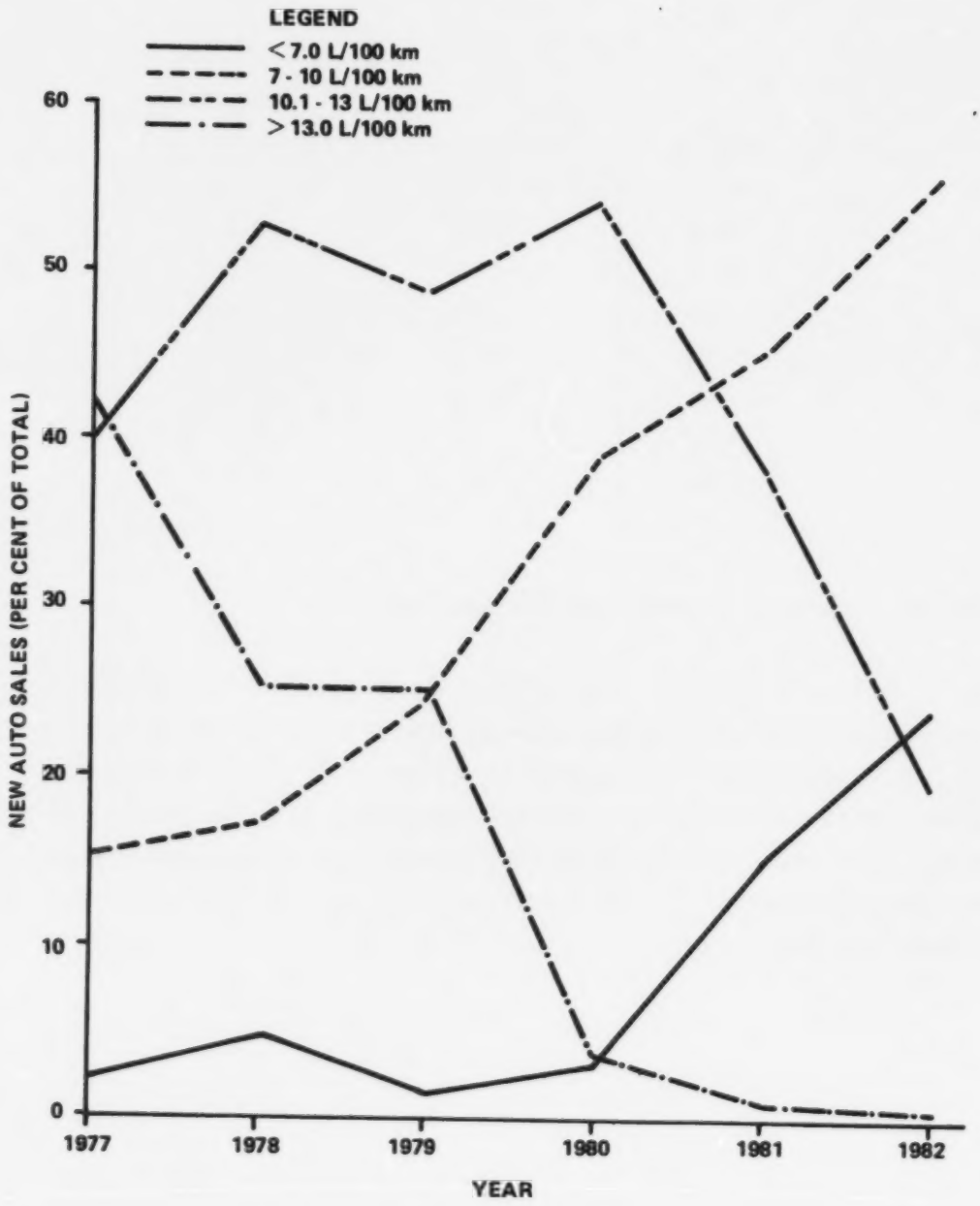
Figure 2.1.2/ Total Number of Licensed Drivers – Ontario, 1970 – 1981

Table 2.1.3/ Sales-Weighted Fuel Efficiency Distribution of New Automobiles, Ontario, 1977-1982

Number of Passenger Automobiles Sold and Percentage					
Year and % of Total	Less than 7 litres/ 100 km	7.0-10.0 litres/ 100 km	10.1-13.0 litres/ 100 km	More than 13 litres/ 100 km	Total
1977	8 331	59 665	152 464	161 196	381 636
%	2.2	15.6	40.0	42.2	100.0
1978	17 879	65 282	197 760	94 849	375 770
%	4.8	17.4	52.6	25.2	100.0
1979	4 789	94 000	186 269	97 326	382 384
%	1.3	24.6	48.6	25.5	100.0
1980	10 178	125 264	174 432	12 308	322 182
%	3.2	38.8	54.1	3.8	100.0
1981	48 643	144 284	121 984	2 964	317 875
%	15.3	45.4	38.4	0.9	100.0
1982	63 415	146 214	51 249	997	261 875
%	24.2	55.8	19.6	0.4	100.0

Sources: R.L. Polk & Co., Ltd.
Transport Canada, Fuel Consumption Guide

The average fuel efficiency of the new automobile fleet in Ontario continued to improved in 1982. Sales of the most fuel-inefficient class (greater than 13 L/100 km or less than 22 mpg), declined from 42.2 percent of total automobile sales in 1977 to 0.4 percent in 1982. Conversely, the most full-efficient class (less than 7 L/100 km or greater than 40 mpg) constituted 2.2 percent of total sales in 1977 and 24.2 percent of total sales in 1982.



SOURCES: R.L. POLK & CO. LTD.
TRANSPORT CANADA, FUEL CONSUMPTION GUIDE

NOTE: The fuel efficiency ratings provided by Transport Canada are based on laboratory testing conditions and may vary to actual on-road fuel efficiency ratings. These ratings are combined city/highway driving estimates.

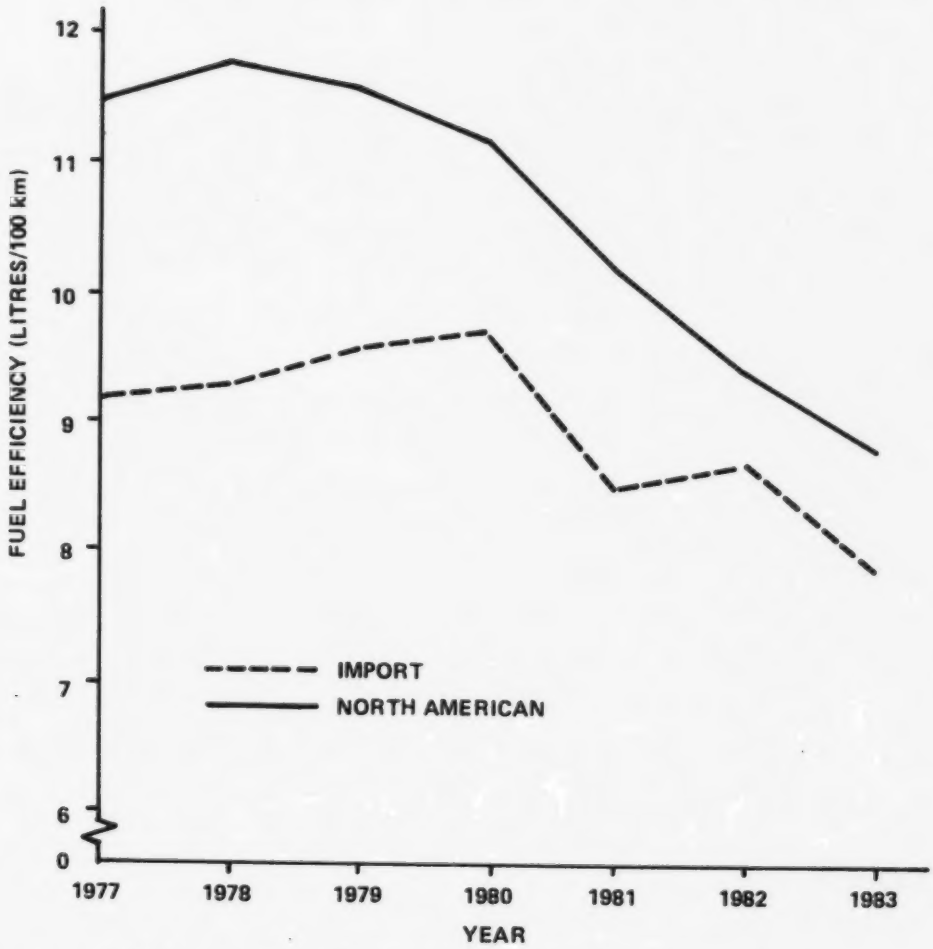
Figure 2.1.3/ Sales-Weighted Fuel Efficiency Distribution of New Automobiles, Ontario, 1977 - 1982

Table 2.1.4/ Average Fuel Efficiency of North American and Imported Automobiles, Ontario, 1977-1983

Year	North American (litres/100 km)	Imported (litres/100 km)
1977	11.5	9.2
1978	11.8	9.3
1979	11.6	9.6
1980	11.2	9.7
1981	10.2	8.5
1982	9.4	8.7
1983	8.8	7.9

Source: Transport Canada, Fuel Consumption Guide

It is well known that the fuel efficiency of imported automobiles has traditionally been better than that of domestically-produced cars. In 1977, the average fuel efficiency of all models in the imported auto fleet was 25 percent better than the comparable domestic fleet. What is surprising, however, is that by 1983 (model-year of automobiles) this gap had been narrowed to only 11.4 percent difference in fuel efficiency between the two fleets.



SOURCE: TRANSPORT CANADA, FUEL CONSUMPTION GUIDE

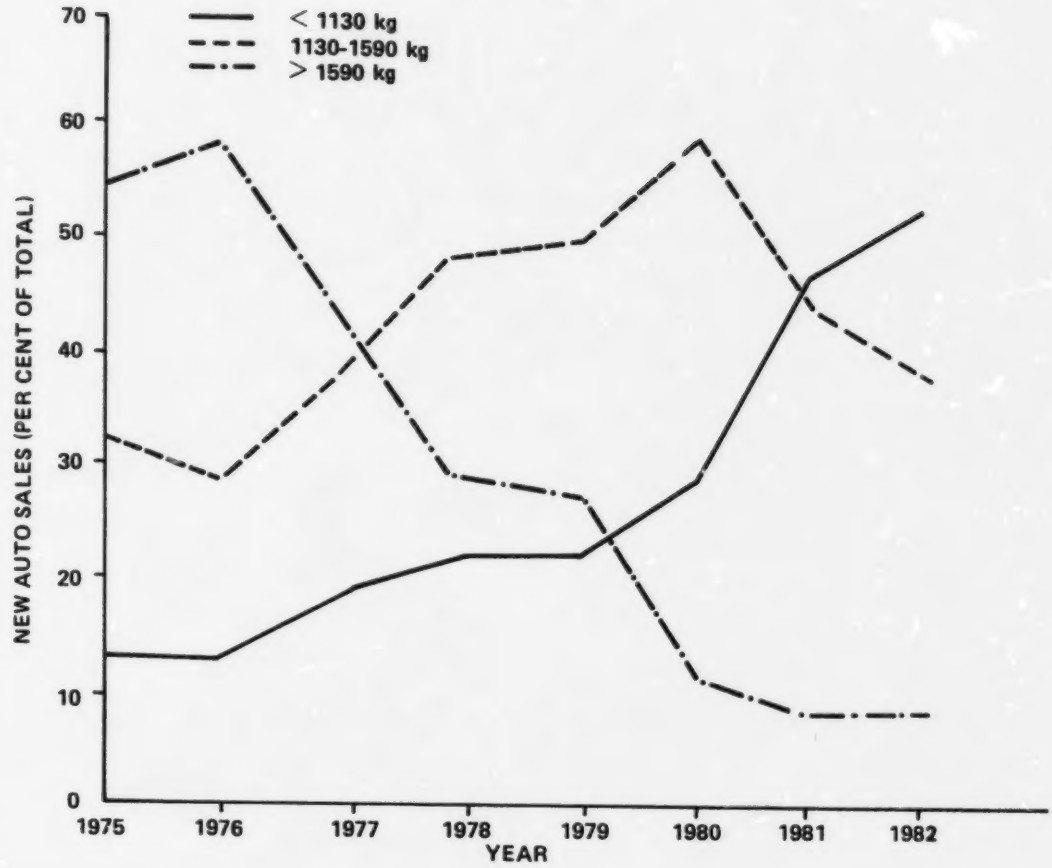
Figure 2.1.4/ Average Fuel Efficiency of North American and Imported Automobiles Ontario, 1977 – 1983

Table 2.1.5/ Sales-Weighted Weight Class Distribution of New Automobiles, Ontario, 1975-1982

Year and % Of Total	Number of Passenger Automobiles With Percentage			
	Less than 1130 kg	1130-1590 kg	More than 1590 kg	Total
1975	41 857	103 920	174 510	320 287
%	13.1	32.4	54.5	100.0
1976	44 022	99 474	201 441	344 937
%	12.8	28.8	58.4	100.0
1977	62 984	122 810	144 230	330 024
%	19.1	37.2	43.7	100.0
1978	83 045	181 873	110 852	375 770
%	22.1	48.4	29.5	100.0
1979	85 272	191 192	105 920	382 384
%	22.3	50.0	27.7	100.0
1980	93 433	190 410	38 340	322 182
%	29.0	59.1	11.9	100.0
1981	149 498	141 019	27 358	317 875
%	47.0	44.4	8.6	100.0
1982	138 320	100 858	22 697	261 875
%	52.8	38.5	8.7	100.0

Sources: R.L. Polk & Co. Ltd.
Sanford Evans Motor Vehicle Handbook

One of the most common mechanisms to effect the fuel efficiency gains indicated on Figure 2.1.3 has been to reduce the average curb weight of the fleet. In this figure it can be seen that the market share (new auto sales) of the heaviest category of automobiles (greater than 1590 kg or 3500 lbs) has declined from 54.5 percent in 1975 to 8.7 percent in 1982. The lightest and smallest automobiles class (less than 1130 kg or 2500 lbs) increased its market share from 13.1 percent in 1975 to 52.8 percent in 1982.



SOURCES: R.L. POLK & CO. LTD., SANFORD EVANS MOTOR VEHICLE DATA BOOK

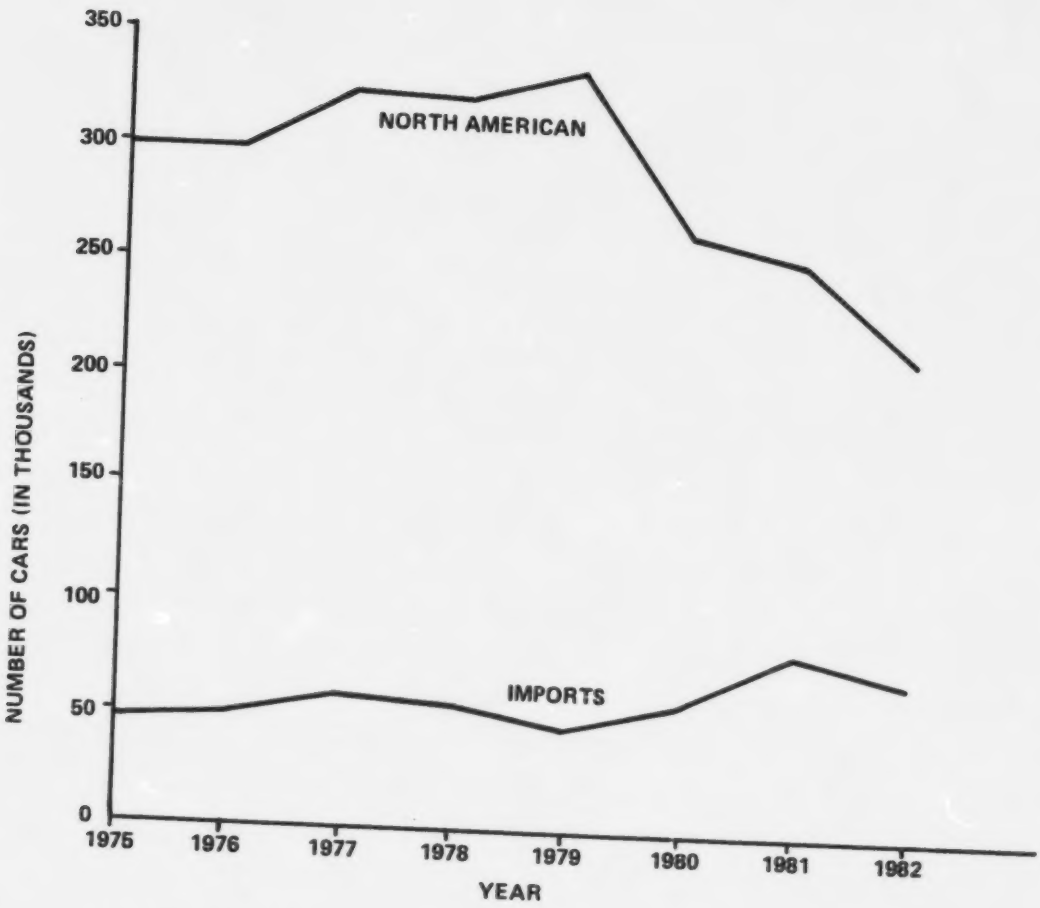
Figure 2.1.5/ Sales-Weighted Weight Class Distribution of New Automobiles – Ontario, 1975 – 1982

Table 2.1.6/ New Car Sales, North American & Imported, Ontario, 1975-1982

Year	North American	Imported	Total
1975	299 983	45 328	345 311
1976	298 479	49 029	347 508
1977	324 100	58 558	382 658
1978	322 975	54 473	377 448
1979	334 365	46 381	380 746
1980	264 251	57 714	321 965
1981	254 139	80 763	334 902
1982	212 277	68 771	280 988

Source: R.L. Polk & Co. Ltd.

Total new auto sales in Ontario have declined to below 1975 levels since peaking in the period 1977 to 1979. Import sales (ie., produced outside of continental North America) have increased from 13 percent of total sales in 1975 to 24 percent of total auto sales in 1981.



SOURCE: R.L. POLK & CO. LTD.

Figure 2.1.6/ New Car Sales, North American & Imported – Ontario, 1975 – 1982

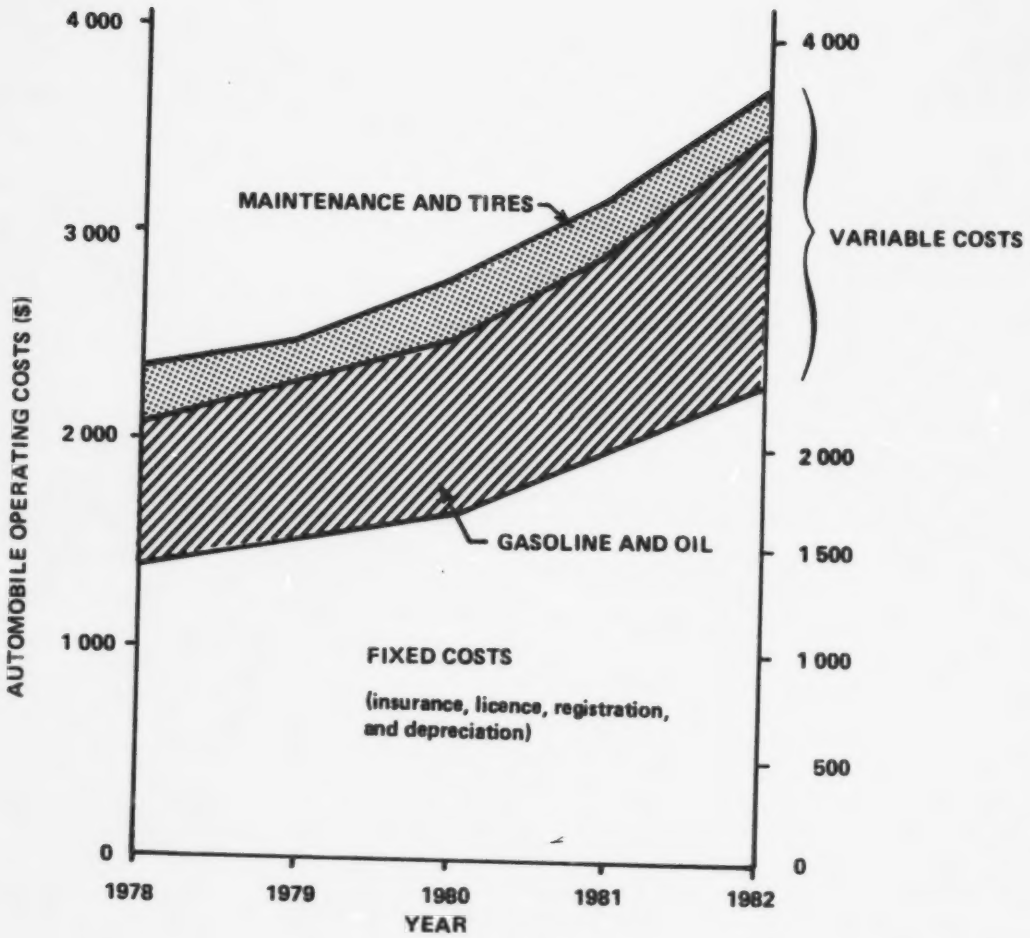
Table 2.1.7/ Average Cost of Operating An Automobile in Canada, 1978-1982

Year	Total Cost	Fixed Cost	Variable Cost	Gasoline & Oil
1978	$2 371	$1 405	$ 965	$ 691.50
1979	2 571	1 531	1 041	955.50
1980	2 810	1 694	1 116	840.00
1981	3 221	1 990	1 231	955.50
1982	3 763	2 329	1 454	1 209.00

Source: Canadian Automobile Association

The total costs of operating an "average" automobile in Ontario rose from $2400 in 1978 to $3800 in 1982, an increase of 59 percent. In 1978, gasoline and oil costs constituted an average of 29 percent of total costs. By 1982, these items constituted 32 percent of total costs; a marginal increase. Most of the remaining expenses associated with operating a car (eg., insurance, depreciation) increased almost as quickly as gasoline and oil costs. In addition, improvements in fuel efficiency over this five-year period have contributed towards restraining the total fuel bill.

NOTE: Variable items are directly related to the number of miles driven, how hard the car is used and how much is spent on service and repair. Fixed costs, through they may vary from car to car and place to place, are normally beyond the control of the motorist and change little with the amount and type of driving.



SOURCE: CANADIAN AUTOMOBILE ASSOCIATION

NOTE: The above figure is a breakdown of the national average cost figures by Runzheimer and Company. Although the test car varies from year to year, the selected car is considered to be an average size car equipped with standard accessories, for each year of testing.

Figure 2.1.7/ Average Cost of Operating an Automobile in Canada, 1978 – 1982

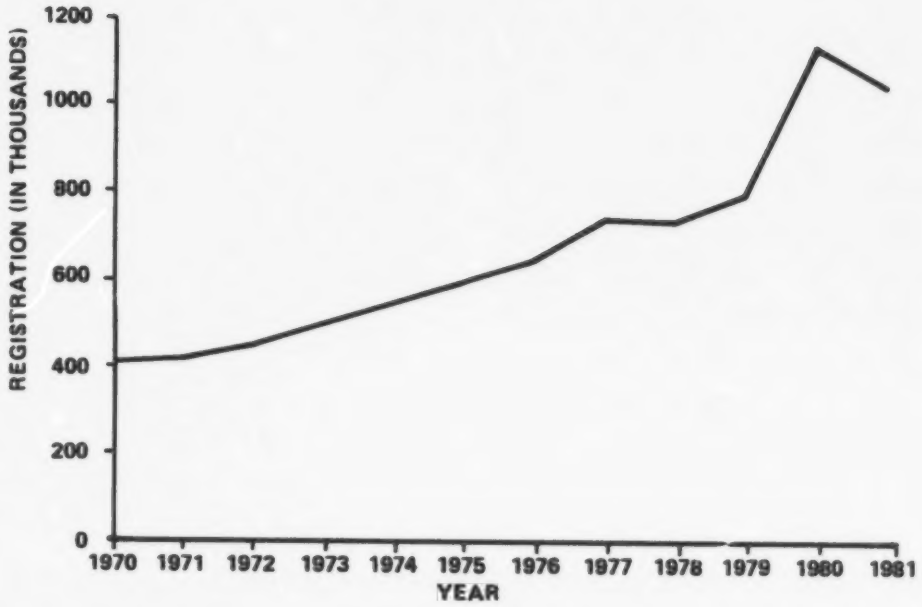
2.2/ Trucks

Table 2.2.0/ Commercial Truck/Tractor Registrations, Ontario, 1970-1981

Year	Number of Registrations
1970	413 241
1971	418 206
1972	452 331
1973	504 891
1974	548 846
1975	597 686
1976	651 409
1977	746 898
1978	738 836
1979	801 140
1980	1 107 930
1981	1 053 798

Source: Ontario Ministry of Transportation and Communications

Figure 2.2.0 shows that the total number of commercial trucks registered in Ontario increased dramatically from 1970 to 1980 (168 percent). However, poor economic conditions in the past two years have led to an abrupt change in this pattern. Most likely, the total number of trucks has not declined as dramatically as indicated on the graph, but the total number of licences purchased has declined. The inference being made is that a large number of truck owners are not using their trucks and are waiting for conditions to improve.



SOURCE: ONTARIO MINISTRY OF TRANSPORTATION AND COMMUNICATIONS

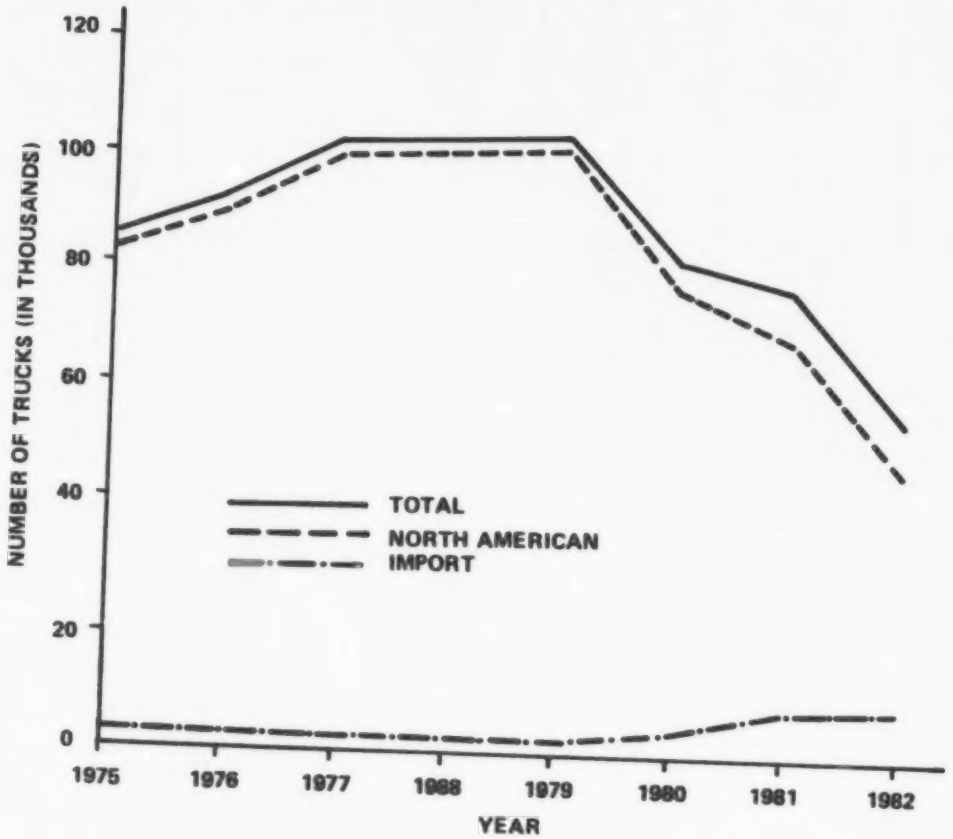
Figure 2.2.0/ Commercial Truck/Tractor Registrations – Ontario, 1970 – 1981

Table 2.2.1/ New Truck Sales, North American and Imported, Ontario, 1975-1982

Year	North American	Imported	Total
1975	83 472	3 064	86 536
1976	90 647	2 462	93 109
1977	100 516	2 842	103 358
1978	101 383	2 785	104 168
1979	102 669	2 433	105 102
1980	78 271	4 207	92 478
1981	69 948	8 422	98 370
1982	46 998	8 866	55 864

Source: R.L. Polk & Co. Ltd.

The number of new truck sales has declined dramatically from a peak of 105 000 in 1979 to 56 000 in 1982 (a drop of 46.8 percent). The principal cause for this decline has been the economic recession during this period. Although sales are expected to improve as economic conditions improve, these lost sales can be translated into future fuel consumption declines.



SOURCE: R.L. POLK & CO. LTD.

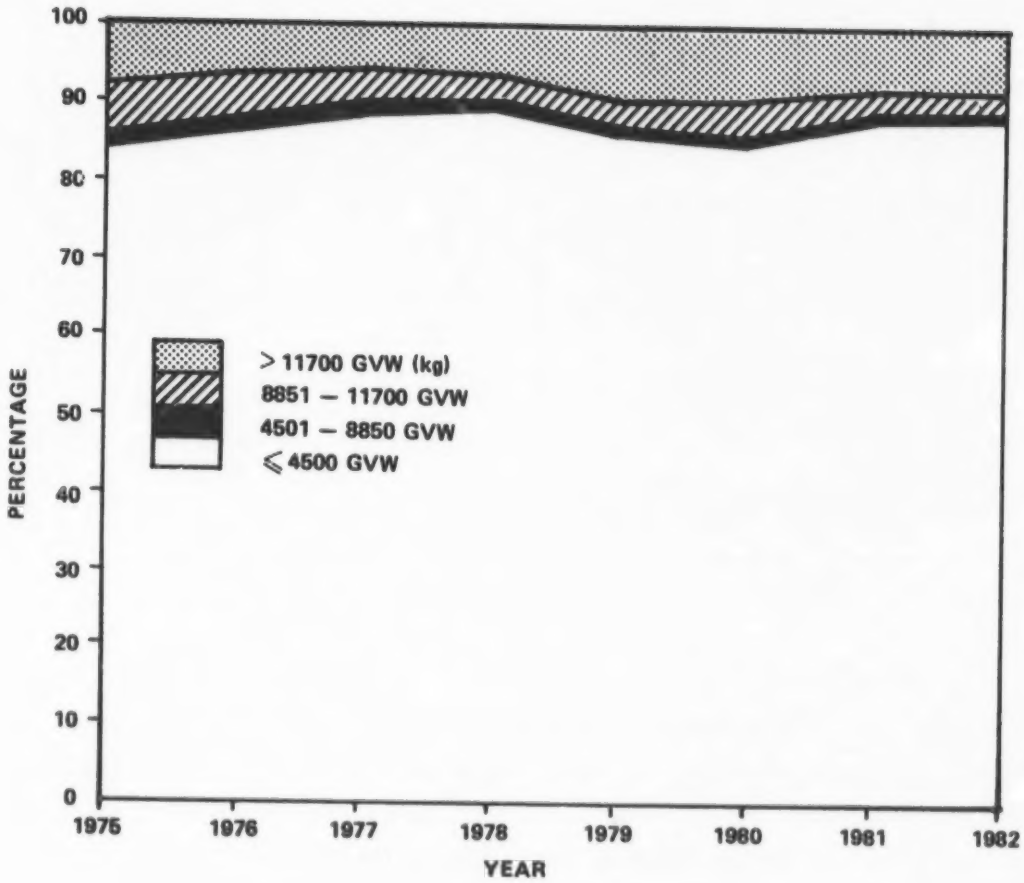
Figure 2.2.1/ New Truck Sales, North American and Imported – Ontario, 1975 – 1982

Table 2.2.2/ Weight Class Distribution of New Truck Sales, Ontario, 1975-1982

Year	Less than or equal to 4 500 kg	4 501 kg- 8 850 kg	8 851 kg- 11 700 kg	More than 11 700 kg	Total
1975	73 051	1 565	5 837	6 047	86 500
%	84.45	1.81	6.75	6.99	100.00
1976	80 289	1 390	5 399	6 041	93 119
%	86.22	1.49	5.80	6.49	100.00
1977	91 466	1 132	4 296	6 474	103 368
%	88.49	1.10	4.16	6.26	100.0
1978	92 712	1 030	3 439	6 987	104 168
%	89.00	0.99	3.30	6.71	100.0
1979	90 538	1 026	3 823	9 715	105 102
%	86.14	0.98	3.64	9.24	100.0
1980	73 833	635	4 055	8 162	86 685
%	85.17	0.73	4.68	9.42	100.0
1981	68 522	499	2 589	6 759	78 369
%	87.40	0.64	3.30	8.63	100.0
1982	49 069	235	1 971	4 589	55 864
%	87.84	0.42	3.53	8.22	100.0

Source: R.L. Polk & Co., Ltd.

The largest proportion of new commercial truck sales still occur in the lightest weight category (less than 4 500 kg or 10 000 lbs Gross Vehicle Weight). Although heavy truck sales occupy a greater proportion of total sales than they did in the mid-1970's, the increase has been marginal in percentage terms. The mid-weight categories of trucks continue to be squeezed out of the sales picture.



SOURCE: R.L. POLK & CO. LTD.

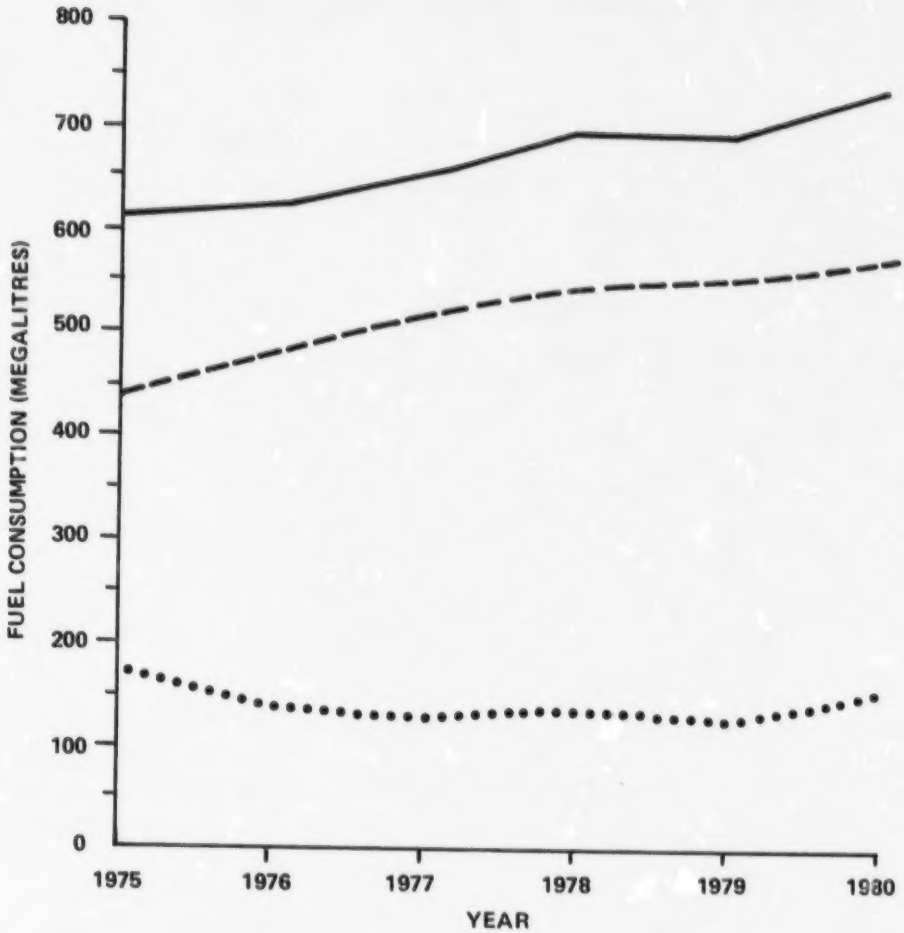
Figure 2.2.2/ Weight Class Distribution of New Truck Sales – Ontario, 1975 – 1982

Table 2.2.3/ Fuel Consumption: Ontario's For-Hire Truck Fleet, Ontario, 1975-1980

Year And % Of Total	Diesel Fuel (Litres)	Motor Gasoline (Litres)	Total (Litres)
1975	445 344 960	168 377 310	613 722 700
%	72.6	27.4	100.0
1976	483 606 390	142 289 660	625 896 070
%	77.3	22.7	100.0
1977	527 146 760	132 704 770	659 851 510
%	79.9	20.1	100.0
1978	556 287 150	145 458 880	701 746 030
%	79.3	20.7	100.0
1979	563 568 020	134 397 230	697 965 250
%	80.7	19.3	100.0
1980	581 725 770	165 596 460	747 322 230
%	77.8	22.3	100.0

Source: Statistics Canada 53-222

As with the total transportation sector, Ontario's for-hire truck fleet increased its fuel consumption between 1975 and 1980. Although data are not yet available beyond 1980, they would most likely reveal a change in this pattern resulting in a decline in consumption. The fuel consumption for the trucking sector follows very closely the economic climate at the time. Generally, an improving economy results in greater production and more truck traffic. During a recession truck traffic and fuel consumption decline.



SOURCE: STATISTICS CANADA, 53-222

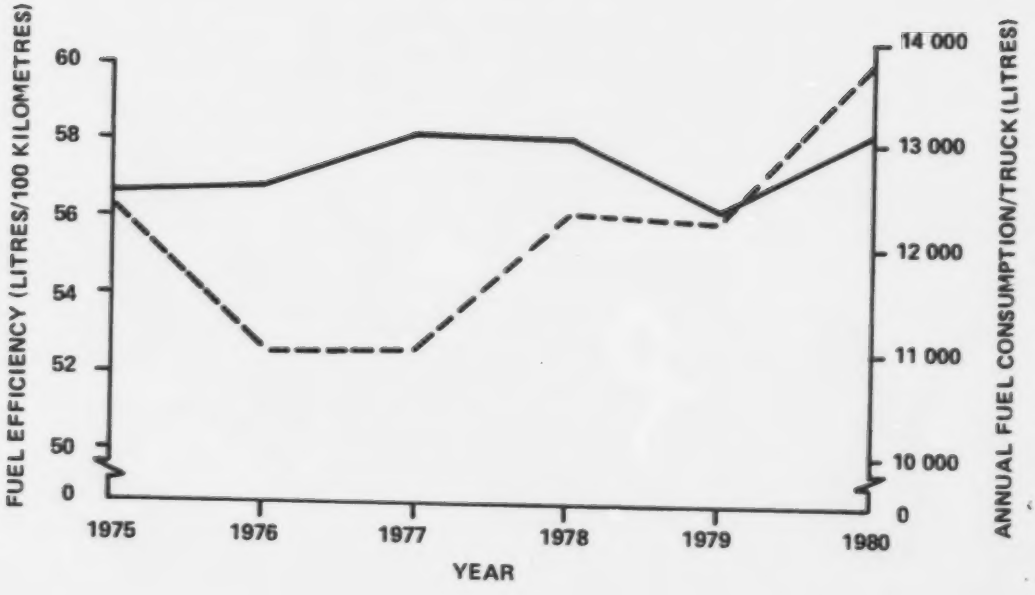
Figure 2.2.3/ Fuel Consumption: Ontario's For-Hire Truck Fleet, 1975 - 1980

Table 2.2.4/ Average Annual Fuel Consumption and Fuel Efficiency Per Truck: Ontario's For-Hire Truck Fleet, 1975-1980

Year	Number of Vehicles	Distance Travelled (mil's of vehicle-km)	Fuel Consumption Per Truck	Gasoline (Litres/100km)
1975	49 051	1 090.94	12 511.9	56.3
1976	49 673	1 188.30	12 609.5	52.7
1977	51 556	1 250.20	12 798.7	52.8
1978	54 860	1 247.00	12 791.6	56.3
1979	56 436	1 248.70	12 367.4	55.9
1980	56 737	1 248.80	13 171.7	59.8

Source: Statistics Canada, 53-222

The fuel efficiency of Ontario's intercity for-hire truck fleet has declined from 52 L/100 km in 1977 to 60 L/100 km in 1980 (the most recent year records are available). This decreased efficiency may be accounted for by the trend towards larger trucks in this sub-sector of the truck population. Therefore, although data are not available, fuel efficiency/ tonne-km has most likely improved over this same time period.



SOURCE: STATISTICS CANADA, 53 - 222

Figure 2.2.4/ Average Annual Fuel Consumption and Fuel Efficiency/Truck: Ontario's For-Hire Truck Fleet, 1975 - 1980

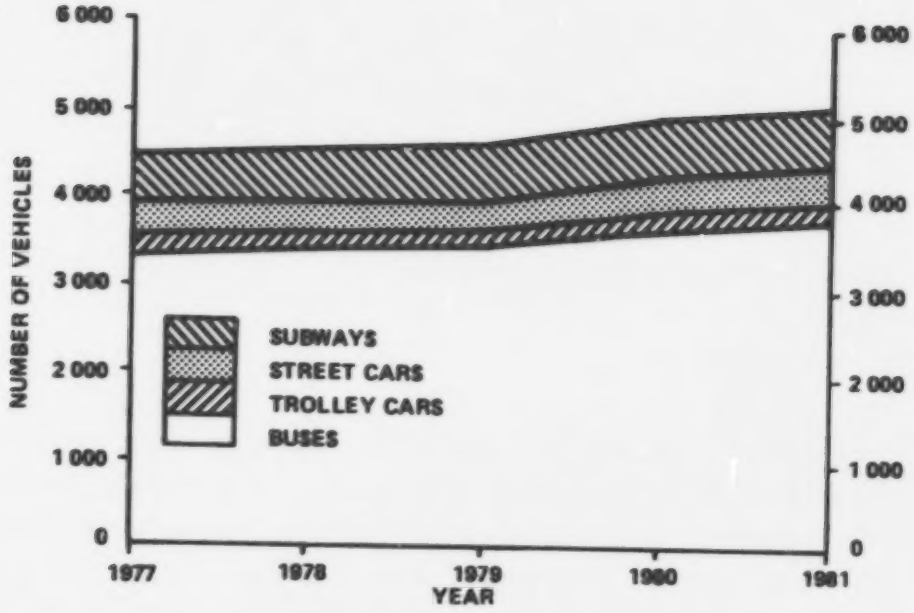
2.3/ Urban Transit

Table 2.3.0/ Urban Transit, Number of Vehicles Owned And/Or Leased, Ontario, 1977-1981

Year and % Of Total	Motor Bus	Trolley Coach	Street Cars	Subway	Total
1977	3 347	200	356	534	4 437
%	75.4	4.5	8.0	12.1	100.0
1978	3 409	211	349	590	4 559
%	74.8	4.6	7.7	12.9	100.0
1979	3 489	211	361	618	4 679
%	74.6	4.5	7.7	13.2	100.0
1980	3 693	207	401	666	4 967
%	74.4	4.1	8.1	13.4	100.0
1981	3 827	207	441	668	5 143
%	74.4	4.0	8.6	13.0	100.0

Source: Canadian Urban Transit Association.

The largest proportion (75 percent) of urban transit vehicles consists of motorized buses. This mode has retained that market share consistently from 1977 to 1981. Subway cars (Metropolitan Toronto) constitute the second largest proportion of total urban transit vehicles within Ontario (12 percent in 1981).



SOURCE: CANADIAN URBAN TRANSIT ASSOCIATION

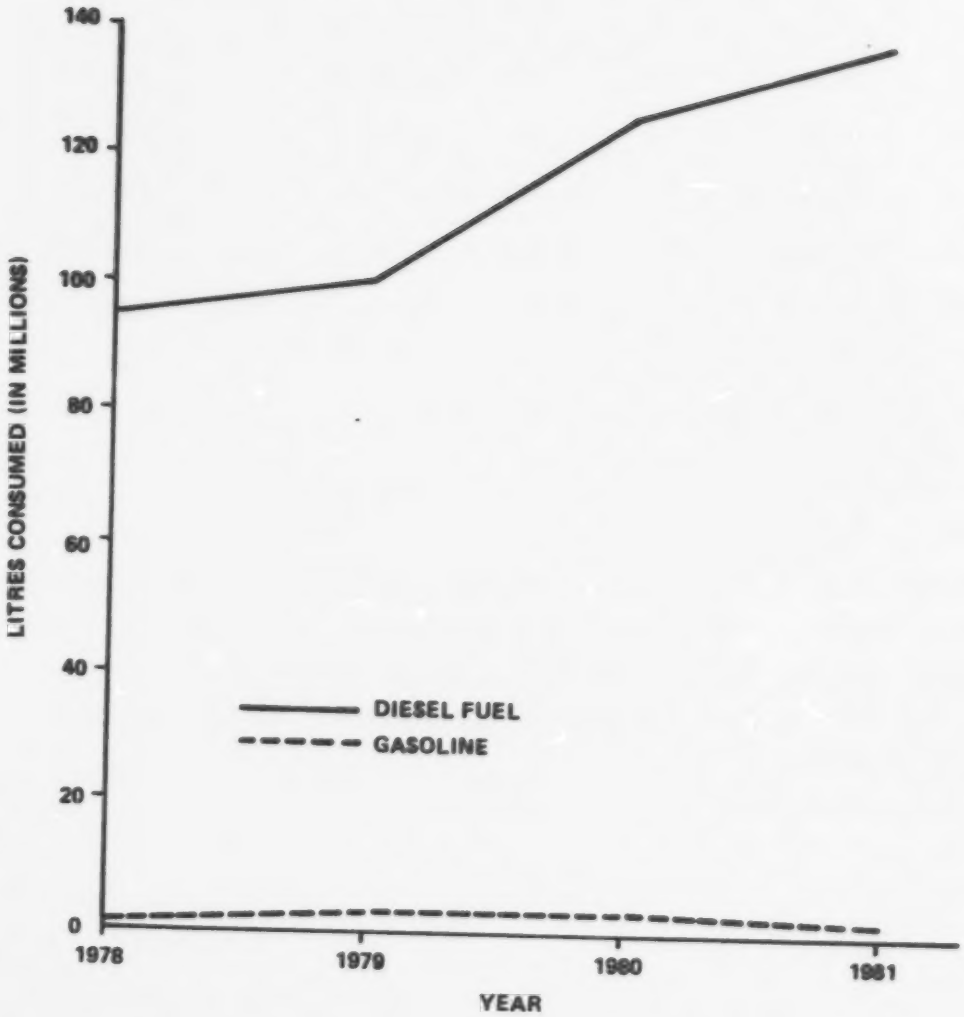
Figure 2.3.0/ Urban Transit, Number of Vehicles Owned and/or Leased, Ontario, 1977 – 1981

Table 2.3.1/ Urban Transit, Gasoline and Diesel Fuel Consumption, Ontario 1978-1981

Year	Diesel Fuel (litres)	Motor Gasoline (litres)
1978	95 530 000	1 546 000
1979	101 285 000	2 023 000
1980	126 599 000	2 456 000
1981	138 313 000	290 000

Source: Canadian Urban Transit Association

The largest proportion of petroleum products consumed by urban transit vehicles in Ontario is in the form of diesel fuel (ie., 98.6 percent). Total fuel consumption has increased from 97 million litres in 1978 to 140 million litres in 1981, an increase of 44.3 percent. This increased fuel consumption represents a greater tendency for the Ontario public to use public transit.



SOURCE: CANADIAN URBAN TRANSIT ASSOCIATION

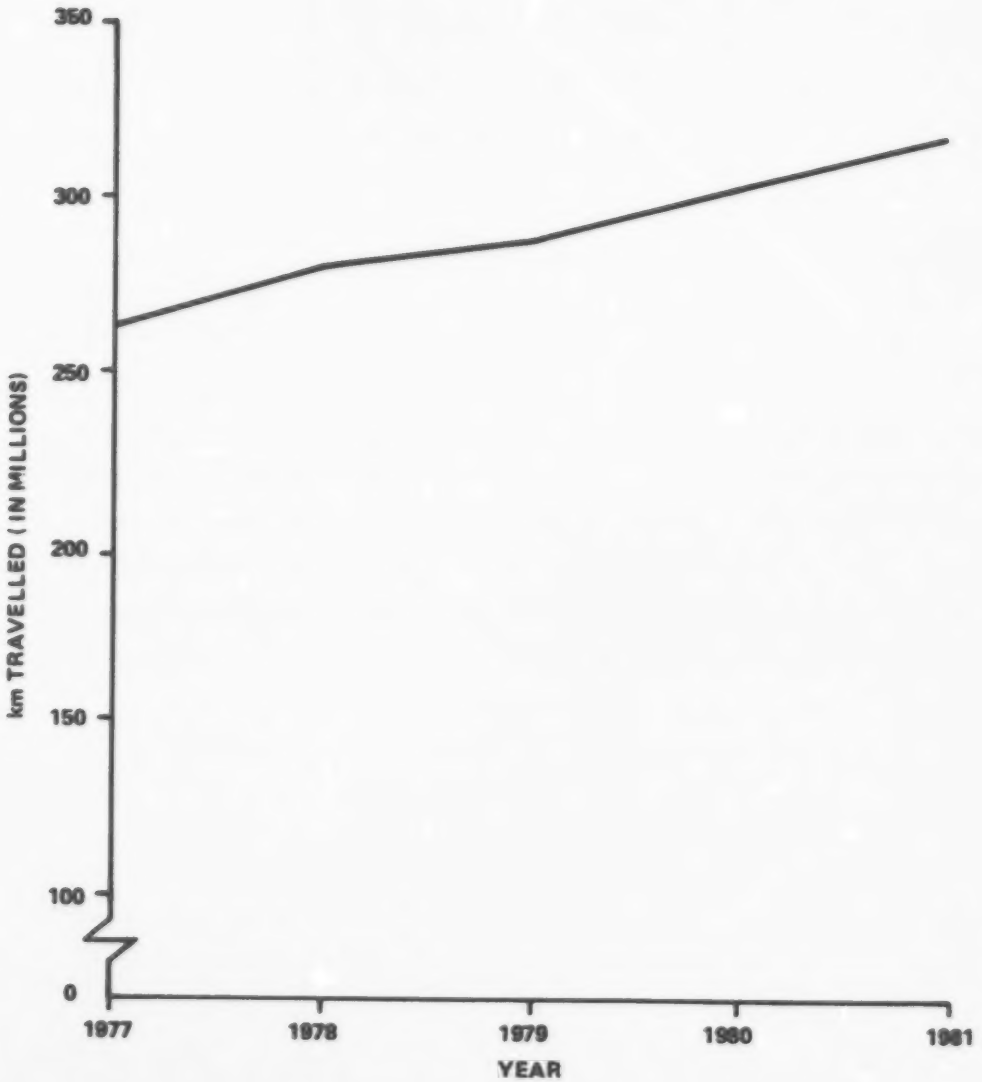
Figure 2.3.1/ Urban Transit, Gasoline & Diesel Fuel Consumption – Ontario, 1978 – 1981

Table 2.3.2/ Urban Transit, Total Vehicle Kilometres Travelled, Ontario, 1977-1981 (000's)

Year	Motor Bus	Trolley Coach	Street Car	Subway	Commuter Rail	Total
1977	184 033	9 736	15 306	54 399	--	263 474
1978	193 862	9 709	15 047	61 449	--	280 067
1979	202 985	9 812	14 727	60 754	--	288 278
1980	217 335	9 814	15 163	62 082	10	304 404
1981	223 836	9 741	14 960	68 496	1 500	318 533

Source: Canadian Urban Transit Association

The total vehicle-kilometres travelled by urban transit vehicles has also increased steadily from 263 474 000 kilometres in 1977 to 318 533 000 kilometres in 1981, an increase of 21.4 percent. This increase is consistent with the fuel consumption increases over the same period, noted in Figure 2.3.1.



SOURCE: CANADIAN URBAN TRANSIT ASSOCIATION

Figure 2.3.2/ Urban Transit, Total Vehicle Kilometres Travelled* Ontario, 1977 - 1981

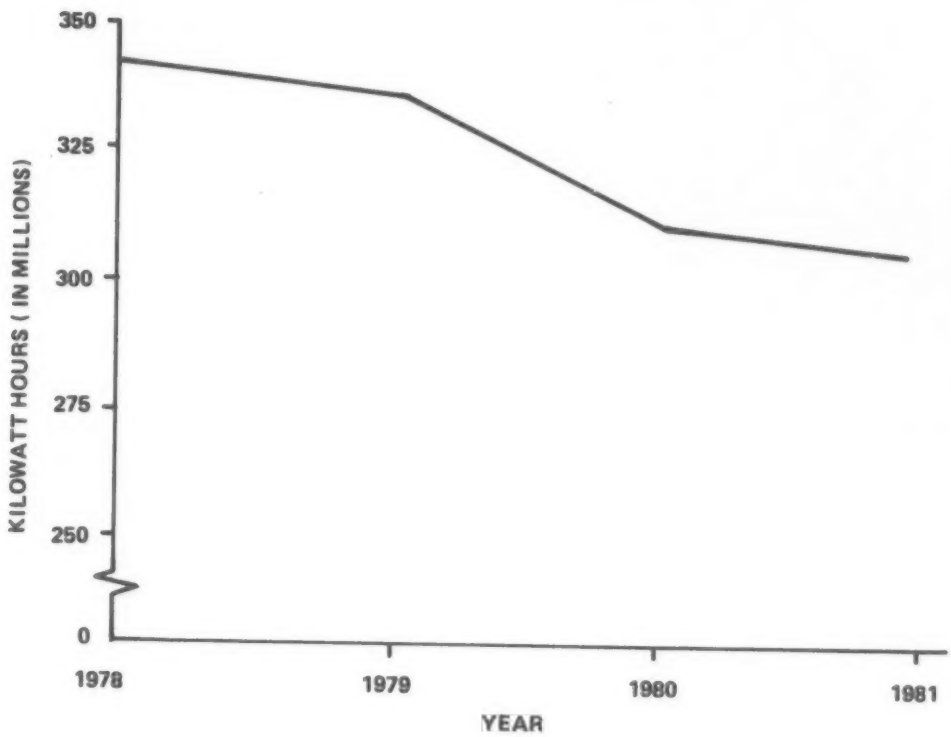
* Includes motor bus, trolley coach, street car, subway, go train

Table 2.3.3/ Urban Transit, Electric Power Consumption, Ontario, 1978-1981

Year	Electric Power (KWH)
1978	342 600 000
1979	336 800 000
1980	311 500 000
1981	306 300 000

Source: Canadian Urban Transit Association

Electric power consumption for urban transit vehicles in Ontario (ie., trolley cars and subway cars) has declined by nine percent over the four-year period from 1978 to 1981. Given the increase in total vehicle kilometres travelled (VKMT) and passengers carried over this same period, this decline may be attributable to improved efficiency in electricity consumption by urban transit vehicles.



SOURCE: CANADIAN URBAN TRANSIT ASSOCIATION

Figure 2.3.3/ Urban Transit, Electric Power Consumption – Ontario 1978 – 1981

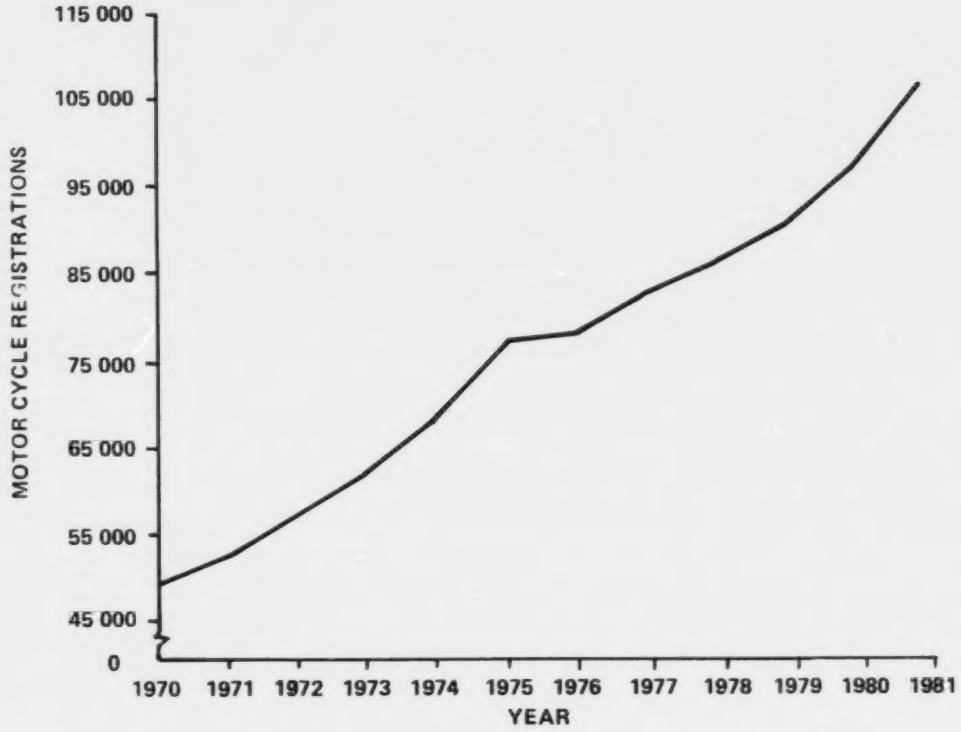
2.4.0/ Motorcycles

Table 2.4.0/ Motorcycle Registrations, Ontario, 1970-1981

Year	Motorcycles
1970	49 758
1971	52 826
1972	57 727
1973	62 200
1974	68 420
1975	77 302
1976	78 284
1977	82 934
1978	86 377
1979	90 933
1980	98 475
1981	107 227

Source: Statistics Canada, 53-219

Figure 2.4.0 shows that motorcycle registrations have increased by a greater proportion than have auto and truck registrations. Between 1970 and 1981, total motorcycle registrations increased by 115 percent. Although the influence of motorcycle use upon total provincial fuel consumption remains minimal, because they are used seasonally and mainly for recreational purposes, this influence has grown over the past twelve years.



SOURCE: STATISTICS CANADA, 53-219

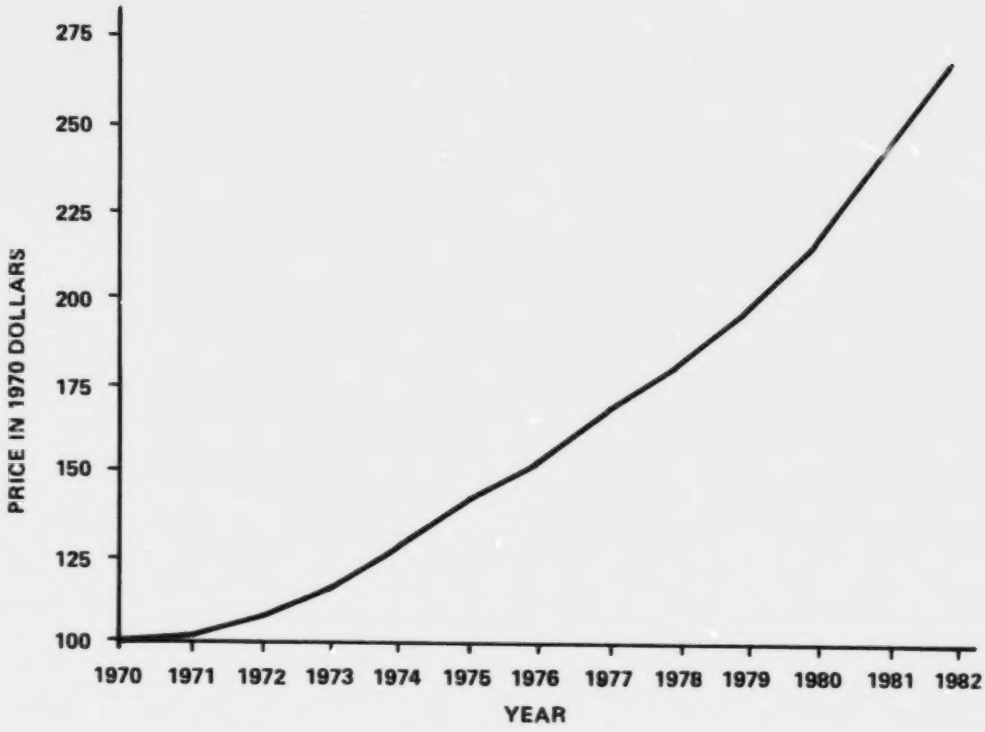
Figure 2.4.0/ Motorcycle Registrations – Ontario 1970 – 1981

APPENDICES

Appendix A/ Consumer Price Index, Ontario, 1970-1982

Year	Consumer Price Index
1970	100
1971	102.9
1972	107.8
1973	115.9
1974	128.53
1975	142.41
1976	153.10
1977	165.34
1978	180.22
1979	196.62
1980	216.48
1981	243.54
1982	269.84

Source: Statistics Canada, 62-001



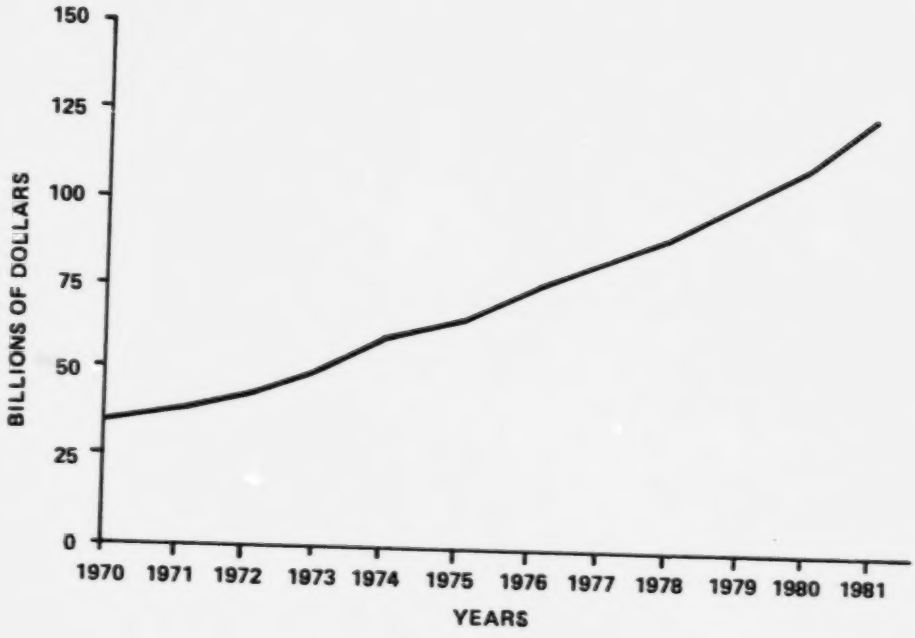
SOURCE: STATISTICS CANADA 62-001

Appendix A/ Consumer Price Index – Ontario 1970 – 1982

Appendix B/ Gross Provincial Product, Ontario, 1970-1981

Year	Gross Provincial Product In Current Dollars (in millions)
1970	$ 35 562
1971	38 875
1972	43 615
1973	50 422
1974	59 229
1975	64 802
1976	74 378
1977	82 267
1978	89 918
1979	100 718
1980	110 991
1981	126 115

Source: Ontario Ministry of Treasury and Economics



SOURCE: ONTARIO MINISTRY OF TREASURY AND ECONOMICS

Appendix B/ Gross Provincial Product – Ontario, 1970 – 1981

Appendix C/ Ontario Government's Policy Targets

Base year is 1980

- a 33% decrease in fuel consumption/passenger-km by 1995;
- a 20% decrease in fuel consumption/tonne-km by 1995;
- a 10% decrease in Ontario government fleet fuel consumption by 1983; and
- a 2% substitution of gasoline by 1985 and 10% of all transportation fuels by 1995 of petroleum products by alternative fuels in transportation.

Appendix D/ Metric Conversion Table

Length

1 mile	= 1.609 kilometres
1 kilometre	= 0.621 miles

Capacity

1 gallon (imperial)	= 4.546 litres
1 gallon (U.S.)	= 3.785 litres
1 litre	= 0.22 gallon (imperial)
1 litre	= 0.264 gallon (U.S.)
1 barrel (petroleum)	= 34.972 gallons (imperial)
	= 158.987 litres
	= 6.12 gigajoules
	= 9 702.0 cubic inches
1 megalitre	= 1 000 000 litres
1 terajoule	= 1.0×10^{12} joules
1 petajoule	= 1.0×10^{15} joules